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With Appendixes on the Archæology and Natural History of Baluchistan and Bahawalpur

BY

HENRY FIELD

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PREFACE

MANY people were directly or indirectly responsible for the success of the 1955 expedition to West Pakistan.

During the entire trip my wife accompanied me as zoologist, recorder and photographer. The excellent series of photographs, especially the portraits of the Baluchis and Brahuis, and the Kodachromes are the result of her ability and skill, often under the most difficult circumstances of trans-desert travel.

To the following I owe special thanks for their interest, guidance and assistance in the success of the expedition.

Washington: Deputy Under Secretary of State for Administration Loy Henderson, Deputy Assistant Secretary of State for Near Eastern and South Asian Affairs Lampton Berry, Officer in Charge, Pakistan-Afghanistan Affairs, Department of State, Mr. Nicholas G. Thacher, the Ambassador, Pakistan Embassy; *London:* Marshal of the Royal Air Force Sir John Slessor, Sir Clarmont Skrine, former Governor, Kalat; *Paris:* General Lord Ismay, former Secretary-General, NATO, Abbé Henri Breuil, Collège de France, Mr. Harper Kelley, *Musée de l'Homme; Cairo:* Dr. Harry Hoogstraal, NAMRU–3; *Dhahran:* Mr. Frederick Davies, President, Arabian American Oil Company, Mr. O. A. Seager and Mr. Don Holm of ARAMCO; *Bahrain Island:* Sir Charles and Lady Belgrave, Mr. and Mrs. Max W. Thornburg, Professor P. V. Glob and Mr. T. G. Bibby; *Karachi:* Mr. Horace Hildreth, U. S. Ambassador, and Staff of U. S. Embassy, especially the Cultural Relations Officer and Miss Megan Fernandez, Dr. Gardiner Bump, U. S. Fish and Wild Life Service, Air Vice-Marshal Cannon, Brigadier Archer-Shee, Office of U. K. High Commissioner, Major General Iskander Mirza, Mr. H. S. Suhrawardy, Minister of Law, the Ministry of States and Frontier Region, especially Mr. Faroughy and Deputy Secretary Mian Manzoor Mohammed, Mr. M. A. Sufi, Assistant Private Secretary to the Prime Minister, Mr. Hassan Ali Abidi, Senior Engineer and Director FOA Projects, Baluchistan States Union, Mr. Raoul Curiel, Director General of Archæology and Staff, especially Mohammed Idris Saddiqi, Dr. Taskhir Ahmad, Director, Department of Plant Protection, Dr. Nazeer Ahmed Janjua, Deputy Director (Technical), Department of Plant Protection, Colonel A. B. A. Haleem, Rector, University of Karachi, Dr. M. A. H. Qadri, Professor of Zoology, Dr. Ahmed Mohiuddin, parasitologist, Dr. A. R. Ranjha, Director, Zoological Survey of Pakistan; *Turbat:* Nawab Bhai Khan, Nawab of Makran, Pirzada Faizullah Shah, District Commissioner; *Panjgur:* Major Ghulam Sarwar, Commandant, Makran Militia, Captain Mohammed Hussain Bhatti, Wing Commander, Makran Militia, Mir Mahmud, brother of Sardar Sir Buland; *Kalat:* H. H. the Khane Azam, Khan of Kalat and President of the Council of Rulers, Major Saadullah Khan, Commissioner of Police, Baluchistan States Union; *Mastung:* Mr. G. N. N. Nunn, United Nations representative; *Quetta:* Major R. S. Saker, Secretariat, Director of Meteorological Service, Geophysical Laboratory, Divisional Superintendent, North-Western Railway, Dr. R. H. Charles, Mission Hospital, Mr. Monforton, FOA representative; *Bahawalpur:* H. H. Alhaj Sir Sadiq Mohammad Khan V Abbassi Bahadur, Nawab of Bahawalpur, Alimartabat Abdur Rashid Khan, Adviser to the Ruler, Sardar Mohammed Rahim Khan Legari, Chief of Police, Bahawalpur State, M. A. Mufti, Assistant Secretary, Dr. S. Masud Ali, Assistant Director Health Services, Mr. Malik Nazir Ahmed, State Librarian, Mr. Chaudhry, Cholistan Development Officer, Mr. Fakhruddin Balley, Publicity Office; *Fort Derawar:* Captain Mahmud Bakhsh, Commandant; *Qaimpur: Sayyid* Abdullah Shah.

Sources in the following Libraries were consulted for references, particularly to Baluchistan.

London: British Museum (Natural History), India Office, Institute of Archæology, University of London, London Library, Royal Central Asian Society, Royal Geographical Society, School of Oriental and African Studies, University of London; *Paris: Musée de l'Homme; Karachi:* Department of Archæology, Government Departments; *Quetta:* Geological Survey of Pakistan; *Bahawalpur:* Sadiq Edgerton College, Government Departments; *Cambridge:* Peabody Museum, Widener Library; *Washington:* Library of Congress, Department of Agriculture, Smithsonian Institution, U. S. National Museum; *Coral Gables:* University of Miami.

As supplementary data 17 Appendixes have been included in this study. Gratitude must be expressed to the following for their contributions:

F. A. Khan, Pakistan Department of Archæology, for his study and report on the pottery collected by the Expedition from Pasni to Quetta and along the Haqra River bed in Cholistan, Bahawalpur; A. Ghosh, Director General of Archæology in India, for permission to include his archæological survey along the Ghaggar (Haqra) River bed from Bikanir toward Bahawalpur; Abdul-Ghaffar, Pakistan Department of Archæology, for translating the ancient texts photographed by Mrs. Field in Fort Marot, Cholistan; Dr. Arthur Loveridge, Museum of Comparative Zoology, Harvard, for the identification of the Reptilia and Amphibia collected by the Expedition in Saudi Arabia, in Baluchistan, Sind and Bahawalpur; Dr. Fritz Haas, Chicago Natural History Museum, for the list of shells collected by the Expedition in Saudi Arabia, Baluchistan and Bahawalpur; Dr. W. L. Brown, Jr., Museum of Comparative Zoology, Harvard, for the identification of Insecta collected by the Expedition in Saudi Arabia, Baluchistan and Sind; Dr. M. H. Khan, Geological Survey of Pakistan, Quetta, for a small representative series of Brachiopoda from the Salt Range, West Pakistan; Dr. Thomas E. Bowman, U. S. National Museum and Dr. P. A. Chappuis, University of Toulouse, for identification of plankton taken by net off Bahrain Island; herbarium specimens from the Qatar Peninsula and the Trucial Coast of Oman by Ronald Codrai; and animal brands in Cholistan sent by Mr. Chaudhry, Cholistan Development Officer.

In addition, gratitude must be expressed to the following for their cooperation and assistance: (*a*) Professor William W. Howells, Harvard University, for his statistical comparison of the Baluchis and Brahuis and for his supervision of part of the computations in the Statistical Laboratory, Peabody Museum; (*b*) Mrs. Natalie B. Stoddard, Miss Irma Pearson and Mr. Newton Hooton for the anthropometric calculations; (*c*) Dr. Mario Cappieri, Government statistician, in Rome for granting permission to select statistical data on Baluchistan and India; (*d*) Dr. Nazeer Ahmed Janjua, Deputy Director, Pakistan Department of Plant Protection, for permission to include data on States and Provinces and on the climate and agricultural development of Baluchistan as well as his list of Insecta (Appendix H); (*e*) Dr. Erwin Raisz for 9 maps based on my traverse notes, photographs by Mrs. Field and the Aeronautical Charts; (*f*) Mr. William B. Jenna for redrawing figs. 8–19; (*g*) Mr. David de Harport, Peabody Museum, for the photographic prints and enlargements; (*h*) Mr. Syed N. A. Z. Hussaini, Irrigation Engineer, Quetta, for his observations on river links of the Indus Valley civilization placed on ADIM No. 5200, pp. 78–92; and (*i*) Dr. A. Ghosh, Director General of Archæology in India, New Delhi, for showing me a copy of the manuscript by Sir Aurel Stein on his archæological reconnaissance along the Ghaggar-Haqra River in Bahawalpur and Bikanir. In London I was given a copy of this unpublished text; this has been placed on ADIM No. 4861, pp. 1–194. Dr. Ghosh plans to publish this text after revision based on his recent discoveries along the Ghaggar, which completely alter the picture. However, my concern was to place on record Stein's observations on the Haqra area from Fort Abbas to Fort Derawar.

Dr. J. O. Brew, Director, Peabody Museum, assisted with the planning of the expedition and granted every facility of the Museum. His interest and encouragement proved a constant source of inspiration.

The manuscript was typed in Coconut Grove by Mrs. Charlotte Weed and Mrs. Irving Levine. Mrs. Weed also assisted with the final checking of the text, the references and illustrations.

Mrs. Burton Stratton, who made a special trip to Florida in order to assist in assembling the final copy for the printer, saw the manuscript through the press.

Special thanks are due to my wife, who generously assisted in the final revision and in the selection of the collotype figures.

Henry Field

Coconut Grove, Florida
May 20, 1958

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AN ANTHROPOLOGICAL RECONNAISSANCE IN WEST PAKISTAN, 1955

INTRODUCTION

FROM January 6 to May 10, 1955, the Peabody Museum of Harvard University sent an expedition on a reconnaissance survey of Baluchistan and Bahawalpur in West Pakistan.

The objectives of this expedition were to fill in some of the known lacunae in prehistory, early history and physical anthropology in these two areas lying on each side of the Indus Valley. Of especial interest were the cultural and physical relationships with Southwestern Asia to the west and India to the east.

In Baluchistan it was planned to search for surface stone implements, make soundings in caves or rock shelters, collect surface pottery, especially on ancient mounds (*dambs*), to record anthropometric data and obtain racial type photographs, to purchase ethnological specimens, to compile tribal information, climatic data and traverse notes and to record native music, folklore and customs. Flora and fauna were also to be collected as additions to those obtained on previous expeditions to Southwestern Asia in 1925–26, 1927–28, 1934 and 1950.

Upon arrival at Karachi it was decided to invite the Pakistan Department of Archæology and the University of Karachi to send specialists so that the proposed expedition to cross Baluchistan from Pasni to Quetta would thus obtain the most valuable results. Mr. Raoul Curiel, Director General of Archæology assigned Mohammed Idris Saddiqi to accompany Mrs. Field and myself across Baluchistan and Cholistan. Idris proved exceptionally helpful. He also assisted in the collecting of sherds from Mand to Quetta and from Fort Derawar to Qaimpur. We are indeed grateful to him.

Upon the recommendation of Dr. M. A. Qadri, Professor of Zoology, Colonel A. B. A. Haleem, Rector of the University of Karachi, gave permission for the following to accompany the expedition: (*a*) Abdur Rauf Khan, geographer, who was writing his Doctorate on the physiographical features of the Makran coast and was anxious to visit the Pasni-Turbat area; (*b*) S. V. Rizvi, geologist; and (*c*) Naeem Beg Chugtai, zoologist. I also engaged Hasham, the snake charmer from Tatta in Sind, to accompany us in order to collect reptiles and amphibians.

After a three-week delay for the issuance of permits, we left aboard the S. S. *Daressa* from Karachi for Pasni. With the generous permission of the Manager, P and O Steamship Company, Bombay, the Captain was requested to make a special stop six miles off Pasni in order for the members of the expedition to debark. When we went ashore through the breakers onto the beach at Pasni, we were a party of eight under the guidance of Mr. H. A. Abidi, Chief Engineer and Director of FOA Projects in Baluchistan States Union. Here we were met by Pirzada Faizullah Shah, District Commissioner, Turbat, who had driven down to escort us back across the desert to Turbat.

Upon arrival in Quetta, everyone except Idris returned by train to Karachi.

The description of our traverses (maps 1–8 and ADIM No. 5185, pp. 53–97) and results obtained from Pasni to Quetta are given in chapter V and from Dera Nawab Sahib to Qaimpur in chapter VII.

Mrs. Field took all the photographs and Kodachromes, acted as Recorder, collected zoological, archæological and ethnological specimens and recorded Baluchi music on the portable EMI tape recorder. For her valuable contributions made during this arduous journey by jeep from the Arabian Sea to Quetta and for taking part in the reconnaissance survey of Cholistan, Mrs. Field was elected a Fellow of the Royal Geographical Society. In addition to the photographs in this publication, the supplementary series has been placed on ADIM Nos. 5627, pp. 1–77; 5628, pp. 1–51; and 5629, pp. 1–61.

The expedition was able to obtain anthropometric measurements, observations and photographs on 85 Baluchis and 151 Brahuis and 39 Miscellanea in Baluchistan.

The Harvard share of the archæological material from Baluchistan and Bahawalpur was shipped by Mr. Raoul Curiel to the Peabody Museum. These sherds are of especial importance because of the large collections from Southwestern Asia already in the study collection and particularly for comparison with the series obtained by Sir Aurel Stein from Persian (Iranian) Baluchistan.

The ethnological collection as well as the majority of the zoological and botanical specimens were also sent to Harvard. The tapes of Baluchi music were deposited for study in the *Musée de l'Homme*, Paris.

During the purchase of the small ethnological collection (Appendix P), many questions were asked regarding the modern way of life of the Baluchis of Makran. In the *Baluchistan District Gazetteer Series*, vols. 7–8, from which I have drawn freely for basic source materials, it appears that there has been little change and wherever possible details and local names in Baluchi were checked. For this reason it seemed desirable to prepare chapter IV for comparison with the *Life-History of a Brahui* by Sir Denys Bray, London, 1913. Attention is also called to the introductory sections in the *Census of India*, 1911 and 1921, where Bray has written at length about the population of Baluchistan. The maps in the *Censuses* of 1911, 1921 and 1931 should be consulted.

Special attention is called to chapter 13, pp. 140–45, references, pp. 146–48, footnotes, pp. 231–34 and 156 statistical tables, pp. 236–342 in *Ancient and Modern Man in Southwestern Asia* published by the University of Miami Press, 1956.

During the compilation of the selected References, primarily to Baluchistan, a wide range of sources both at home and abroad was searched. Attention is called to the following basic source materials on Baluchistan: (*a*) Kalat, Kharan, Makran and Quetta-Pishin by R. Hughes-Buller in the *Baluchistan District Gazetteers*, 1907–1908, Bombay; (*b*) *Imperial Gazetteer of India* (Provincial Series), vol. 6, pp. 265–341, Oxford University Press; (*c*) *Annual Administration Reports*, nos. 1–2, of the Baluchistan Agency, Calcutta, 1877; and (*d*) *Census of India*, 1881, 1891, 1901, 1911, 1913, 1921, 1923, 1931, 1934 and 1941.

Through the Assistant Map Curator, Royal Geographical Society, sections on Baluchistan and Bahawalpur in the *Imperial Gazetteer of India* were microfilmed by Kodak Ltd., Recordak Division, in London.

In order to complement the list of Insecta from Baluchistan (Appendix H), titles to publications by Dr. Taskhir Ahmad and Dr. Nazeer Ahmed Janjua and their co-workers have been included.

Despite careful search in Karachi, New Delhi and London, it has not been possible to complete some of the early references to Baluchistan. The editions were limited and copies now are extremely scarce even in the India Office Library, where many obscure references were checked.

The writings of Dr. Maneck B. Pithawalla, former Professor of Geography, University of Karachi, should be consulted for basic information on Baluchistan, especially his theory regarding desiccation (*see also* Stein, 1945).

The most recent archæological studies in Baluchistan have been published by Walter A. Fairservis, Jr. (*see* References). These titles should be consulted in reference to the pottery collected by the Expedition from Mand to Quetta (*see* Appendix A).

Since earthquakes have played a prominent role in Baluchistan, the most significant titles have been given. A few titles dealing with racial or cultural contacts with Baluchistan from adjoining areas have been included.

The Bibliographies by Ghani (1951), by Keddie and Bauer (1956) and M. A. Khan (1956) should be consulted.

Since Mohenjo-daro, Chanhu-daro, Harappa and Taxila lie in the Indus Valley outside our focal areas, only a few selected references have been given. Attention is called to the publications by Sir John Marshall and Dr. Ernest Mackay.

In addition to the references to Anthropology and Archæology, numerous titles to Natural History have been given to supplement the text and some of the Appendixes.

The reader is referred to my "Bibliography on Southwestern Asia: I–V" with 31,309 titles and Author Indexes published during 1953–1958 by the University of Miami, Coral Gables, Florida. These bibliographies deal with anthropogeography (19,268 titles) and natural history (zoology with 8,585 titles and botany with 3,456 titles). The anthropogeography section deals primarily with references published since January 1, 1940. Under the various Natural History headings no time limit has been placed. A Subject Index to B: I–V is in preparation The following supplementary references to Baluchistan are included in my "Bibliography on Southwestern Asia: V": Nos. 4334, 4357–60, 4494, 4536, 4563, 4598, 4599, 4770, 4771, 5017, 5211, 5473, 5650, 5653, 5677, 5713, 5764, 5853, 5854, 5911, 6057, 6083, 6141, 6222, 6286, 6316, 6379, and 6425; published in October, 1958, by the University of Miami Press.

The original Harvard anthropometric forms have been placed on ADIM Nos. 4876, pp. 1–139 and 4877, pp. 1–140 in the American Documentation Institute, c/o Photoduplication Service, Library of Congress, where a copy may be purchased.

Additional material has been placed on microfilm in the American Documentation Institute: (*a*) "Urban geography of Multan and neighborhood" by Mumtaz Husain on ADIM No. 4816, pp. 1–211; (*b*) "A geographical survey of locust-affected areas in West Pakistan" by Ashar Saeed Khan on ADIM No. 4845, pp. 1–179; (*c*) "Urban geography of Sukkur and neighborhood" by Abbas Ghulam on ADIM No. 4763, pp. 1–244; (*d*) "Lahore: a study in urban geography" by Naseer Ahmed Jan on ADIM No. 4764, pp. 1–161; (*e*) "Anthropometric data on 137 Baluchis" by Henry Field on ADIM No. 4876, pp. 1–139; (*f*) "Anthropometric data on 138 Brahuis" by Henry Field on ADIM No. 4877, pp. 1–140; (*g*) "A reconnaissance along the Ghaggar-Haqra River" by Sir Aurel Stein on ADIM No. 4861, pp. 1–194; (*h*) "Pakistan fights against locusts" by Ashar Saeed Khan on ADIM No. 5200, pp. 44–52; (*i*) "Bahawalpur, 1948–54" by the Directorate of Public Relations, Bahawalpur Government on ADIM No. 5200, pp. 53–77; (*j*) "River links of the Indus Valley civilization" by Syed N. A. Z. Hussaini on ADIM No. 5200, pp. 78–92; (*k*) "Archæological heritage of Pakistan" by Pakistan Department of Archæology on ADIM No. 5200, pp. 93–101; (*l*) "Explorations in Bikanir" by Dr. A. Ghosh, Director General of Archæology, New Delhi, on ADIM No. 5200, pp. 102–15; (*m*) "Makran Village List" by Pakistan Census Department on ADIM No. 5185, pp. 38–52; (*n*) "Expedition traverse reports from Pasni to Quetta" by Henry Field on ADIM No. 5185, pp. 53–97; and (*o*) "Archæological notes from Kharan" from the *Gazetteer of Baluchistan* on ADIM No. 5286, pp. 39–49.

In some cases the Christian names or initials of British Military or Political Officers could not be ascertained. Their reports were incorporated into the *Gazetteers* and, as such, excerpts have been quoted in this study.

There appear variations in the spellings of tribal names; these will be cross-referenced in the Index. The form of the place-names follows the more generally accepted style. In the References, however, the older spellings of Beloochistan, Mekran and Kelat have followed the published form. With few exceptions, all diacritical marks have been omitted.

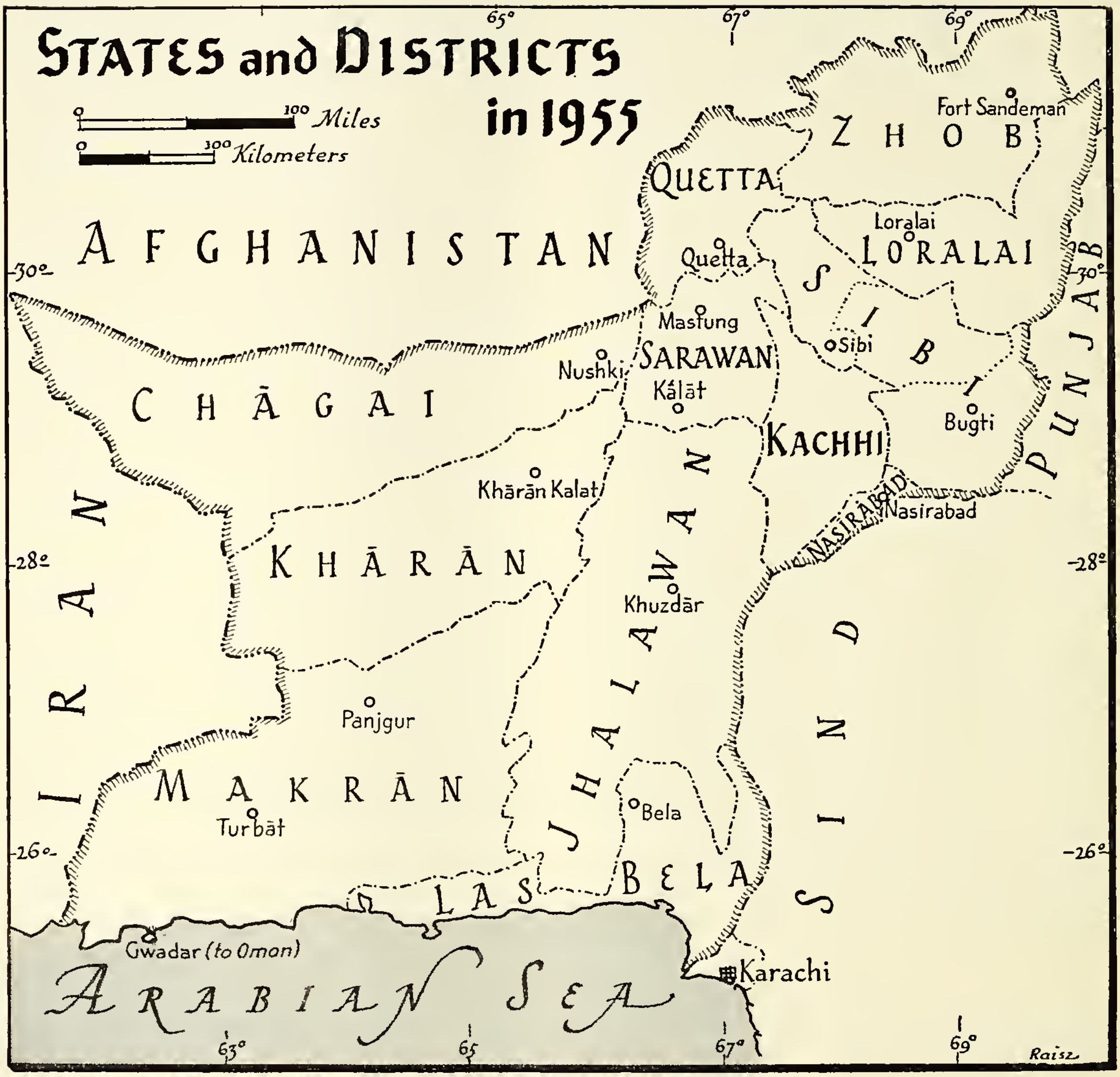

FIG. 1. States and districts of Baluchistan in 1955.

Chapter I

THE LAND

BALUCHISTAN forms the extreme western province of West Pakistan. This approximately rectangular area is located between Latitude 24° 54′ and 32° 40′ North and Longitude 60° 56′ and 70° 15′ East.

In 1951, the area was given as 134,000 square miles, exclusive of the 307 square miles of Gwadar port area described in the 1931 Census as "the small inlet of territory around Gwadar which is at present in the possession of the Sultan of Muscat and to which the Khans of Kalat have never waived claim." In August, 1958, Gwadar was returned to Pakistan.

On the south the coast line of 471 miles borders the Arabian Sea; to the west the provinces of Makran, Kharan and part of Chagai march with 520 miles of Iran; to the north, Chagai, Quetta and Zhob border on 723 miles of Afghanistan and in the extreme north, 38 miles are listed as No Man's Land, but still are part of West Pakistan.

The administrative boundaries (fig. 1) include the 5 districts of Chagai, Loralai, Quetta-Pishin, Sibi and Zhob and the Kalat, Kharan, Las Bela and Makran States forming, in April, 1952, the Baluchistan States Union.

Geology

No detailed geological survey has been conducted. A reconnaissance survey by Vredenburg (1909a) and Tipper during the winter season of 1905–1906 still stands as the major work for most areas. The Geological Survey of Pakistan commenced work during 1950–51, assisted by an aerial survey in 1955. The best summary is given by Pithawalla (1952a, pp. 12–14) based on work by Crookshank and others. Figure 2 has been compiled by Dr. Raisz from the most recent data.

Baluchistan forms part of the western extension of the Himalayas linking to the Iranian Plateau. The rocks are mainly sedimentary, consisting of limestone, sandstone and shale ranging from the Mesozoic to post-Tertiary periods. Lateral compression has resulted in complex folds and many faults. The geological and morphological features are similar to those of the Iranian Plateau, for Baluchistan may be considered as its southeast extension.

Two rock formations, running north–south along Longitude 66° 15′ East were formed by a subterranean ridge: (*a*) Permian-Carboniferous series forming the eastern highlands; and (*b*) Oligocene (Flysch) series in the western lowlands including the Hamun areas. As a result, this area may be divided into calcareous on the west and shaly on the east. These rocks are highly fossiliferous with Triassic, Jurassic, Cretaceous and Tertiary fossils.

In eastern Baluchistan from Takht-e-Sulaiman to the Makran coast and facing the Punjab and Sind, a series of anticlines and synclines of Jura type appear mainly with a north–south strike. Triassic rocks are exposed in the denuded anticlines with intercalations of limestone, shale and slate several thousand feet deep. Marine rocks, comparable to Triassic and Oölitic limestones, are superimposed, followed by Cretaceous shales and limestones resting upon Jurassic formations.

Western Baluchistan is composed of thick shallow-water deposits of Oligocene and Miocene sandstones, clay and green shales forming a broad, upland belt from the Makran coast northward across the Hamun toward the Chagai District. Upper Tertiary rocks cover large areas of Makran, including the coastal cliffs near Ormara, Pasni and Gwadar. Amid these sedimentary series lie igneous intrusions particularly in the Ras Koh in Chagai. Upper Tertiary volcanic tuffs and basalts are associated with Middle Tertiary igneous rocks, both often superimposed with Late Tertiary to recent volcanoes, now extinct, but with sulphur deposits in Koh-i-Sultan, Kuh-i-Taftan (Iranian Baluchistan) and Koh-i-Bazman.

Mud volcanoes are found at several points on the coast between Sonmiani and Jashk. By the natives these volcanoes are termed "daria chasham," signifying "eye of the sea."

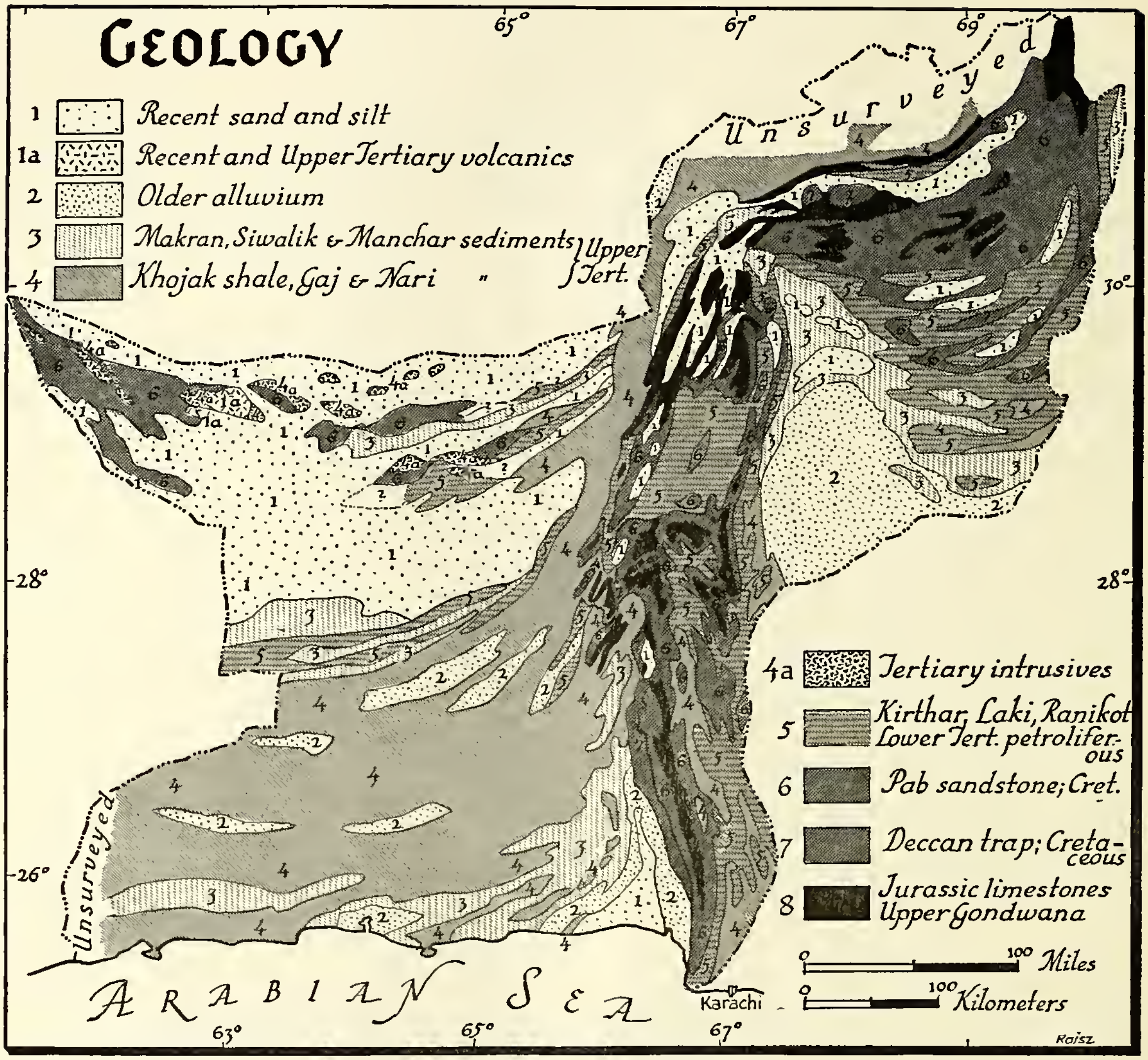
GEOLOGY
1 Recent sand and silt
1a Recent and Upper Tertiary volcanics
2 Older alluvium
3 Makran, Siwalik & Manchar sediments
4 Khojak shale, Gaj & Nari "
Upper Tert.
4a Tertiary intrusives
5 Kirthar, Laki, Ranikot Lower Tert. petroliferous
6 Pab sandstone; Cret.
7 Deccan trap; Cretaceous
8 Jurassic limestones Upper Gondwana
0 100 Miles
0 100 Kilometers
Unsurveyed
Unsurveyed
Arabian Sea
Karachi
63°
65°
67°
69°
30°
28°
26°
Raisz

Fig. 2. Geology of Baluchistan.

Fresh-water formations include the 3 Siwaliks, each unconformable, in the Bugti area. Pleistocene gravels and conglomerates are 2,000 feet thick in the Bugti-Mari area and attain 5,000 feet in other parts of Baluchistan. Loess occurs where funnel-shaped openings in hills lie in the direction of the prevailing wind as, for example, in the Zhob Valley. Pleistocene alluvial fans, resulting from the denudation of the sedimentary rocks, form huge taluses (*damans*) extending from the mountains and hills.

Earthquake epicenters and lines of stress indicate a tectonic force along a line running northwest–southeast. The devastating earthquake in Quetta on May 31, 1935 and more recent shocks prove the lack of stability in this region. On April 15 as we were leaving Quetta, there were two mild earthquakes. However, these were of sufficient intensity to cause people to run out of buildings. Ghani (1951, pp. 17–18) gives 41 references to earthquakes in Pakistan, the majority at Quetta.

Physical Geography

Baluchistan forms the eastward extension of the Iranian Plateau with the same general physiographic characteristics (*see* Field, 1939,

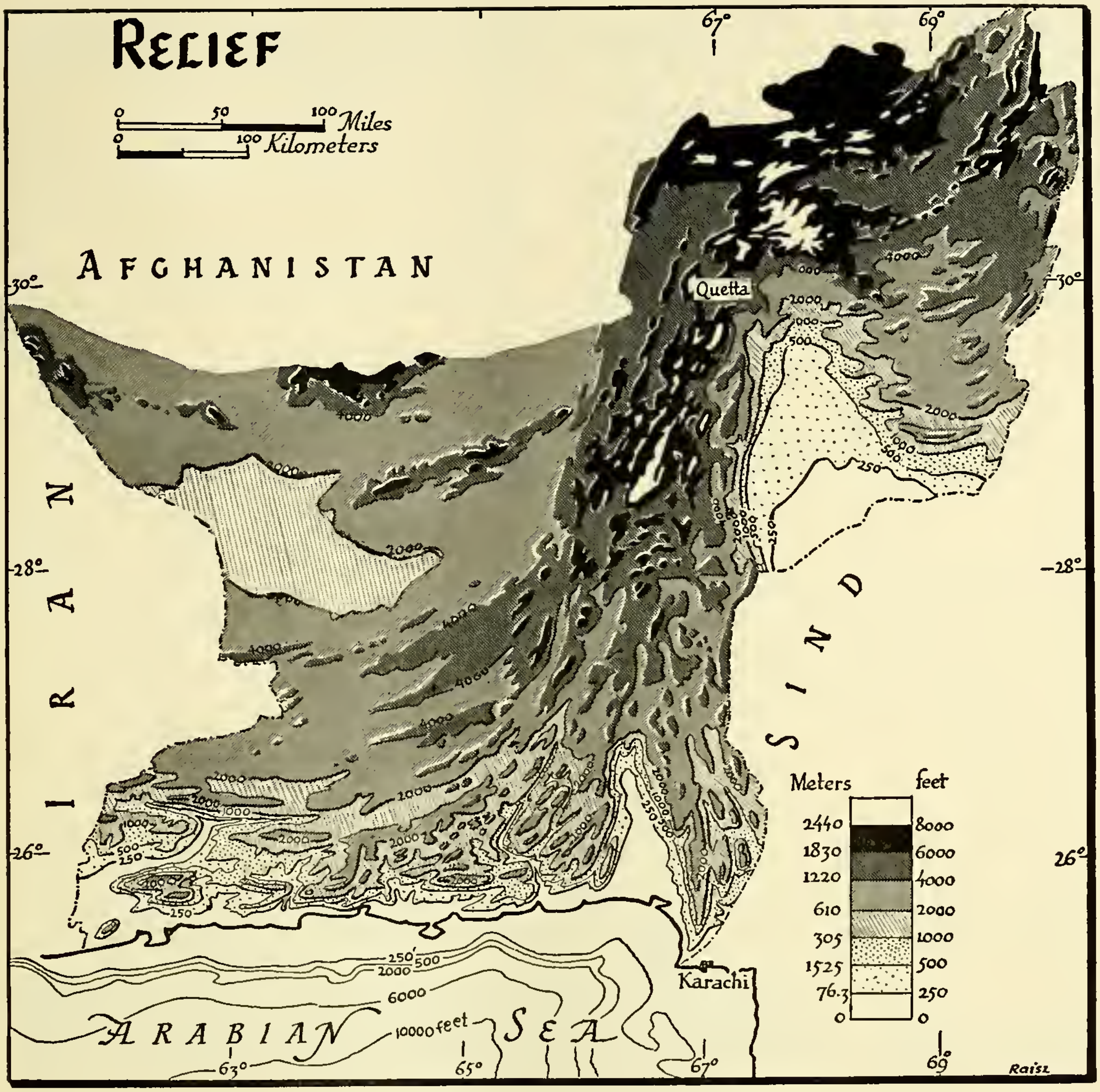

Fig. 3. Relief and contours of Baluchistan.

pp. 16–19 and frontispiece map). Figure 3 has been compiled by Dr. Raisz from the most recent data.

During the Tertiary Period after the upheaval of the Himalayas from the Tethys Sea, the land of the Baluchis was born.

This basin, surrounded by highlands, possesses an elaborate system of inland drainage gathered by the Hamun-i-Lora, Hamun-i-Murgo and the Hamun-i-Mashkel. Only in the north does the Zhob River cut through the mountains and, joining with the Gomal, flow into the Indus Valley. To the south some rivers have cut through the Central and Coastal Makran ranges to the Arabian Sea. The long, unindented Makran coast line results from a fault which extends eastward as far as the Indus Delta into the Arabian Sea, forming a continental shelf located in 1932 by the Murray Expedition.

Like Afghanistan, Baluchistan is a country of mountains intersected by narrow valleys, and aptly described as an extensive and varied system of mountain ranges, upheaved through an enormous plain, covered with boulders and shingle, with, here and there, deposits of soil in narrow strips along the lines of drainage.

The Hala or Brahuik mountain system gives Baluchistan its rugged and barren character. This name was given to the range by Pottinger (1816). It has, however, several local names. Beginning from the north, that portion which separates the highlands of Sarawan from the low portion of Kachhi is known as Takari. Further south and down to the 26th parallel, this chain is called Kirthar, and thence to the ocean it is called the Pab Range. Similarly, other offshoots west of these are known as the Harbui, the Danwara, and the Hara mountains. These last form a line of demarcation between the Las Bela and the Makran provinces.

This range, a prolongation of the Sulaiman, strikes southward to the Indian Ocean, into which it disappears at Cape Monze (Ras Mawari). It throws out westward and southwestward numerous offsets which, strangely parallel in strike, traverse Makran and either sink into the Indian Ocean, or the desert plains in eastern Iran, or merge into the Persian mountain system.

Regarding the Sulaiman and Hala ranges as an offset from the Hindu Kush, we find that the elevation gradually diminishes toward the south. Thus, at the highest accessible point in the north, viz., the "Pass of Irak at Bamian," the elevation is 13,000 feet above sea level, that of the inaccessible peaks attaining to about 18,000 feet, while at Shal the highest inaccessible point is under 11,000, and the elevation of the Shal Valley has been estimated at 5,900 feet. From this area to Kalat the country ascends perceptibly, the valley of Kalat being about 1,100 feet higher than that of Shal. Thence to the seacoast, a distance of nearly 300 miles, the country presents a gradually inclined plane along the lines of drainage; the various ranges and their numerous branches are consequently subjected to the same depression, until they subside to an elevation not exceeding 200 feet in the neighborhood of Cape Monze.

Like the Hindu Kush and other ranges forming the western continuation of the Himalayas, the mountain system of Baluchistan is marked by a peculiar barrenness. The physical features remain the same in the rocky, scarped and inaccessible faces. Some of the offsets are composed of a hard conglomerate and of friable mica slate, decomposed on the surface. The higher ranges consist, for the most part, of limestone. The valleys enclosed by these mountain ranges and their numerous offsets vary greatly in altitude and general character. Most of them are narrow, and run parallel to the ranges, while the arable land, confined to the line of drainage, and the open space between boundary hills, is frequently an inclined plane, strewn with boulders and shingle. This description applies particularly to the valley of Shal, to the base of Chilhiltan Mountain and the various minor ranges extending south and west toward Kalat and Nushki. At this latter point the mountain overhanging the place affords to the north-northeast a remarkable instance of the glacis slope, described as characterizing the physical configuration of the northern parts of Afghanistan, while further south this feature becomes less and less marked until it entirely ceases some 50 miles south of Kalat.

The other form of valley (from which the greater portion of the agricultural produce is derived) is, generally speaking, entirely covered with good soil, except at the base of the hills. Here, as before described, it is invariably stony, and the great difference between these forms of valley lies in the amount of arable land. Mastung, Kalat and Baghwana may be noted as particular instances belonging to this form of valley.

The country may be divided into 4 regions:

a) Upper highlands forming the central and east-central areas.

b) Lower highlands forming the slopes of the Sulaiman Mountains on the east, the Pab and Kirthar ranges on the south, and the hills of Makran, Kharan and Chagai on the west.

c) Plains including the triangular Kachhi, western Las Bela and the Dasht Valley in Makran.

d) Deserts with extensive sand hills and black gravel-covered areas in the northwest.

The principal mountain ranges include:

a) Sulaiman (250 miles) separating Baluchistan from the Punjab and the North-West Frontier Province with the highest peak Takht-e-Sulaiman (11,295 feet).

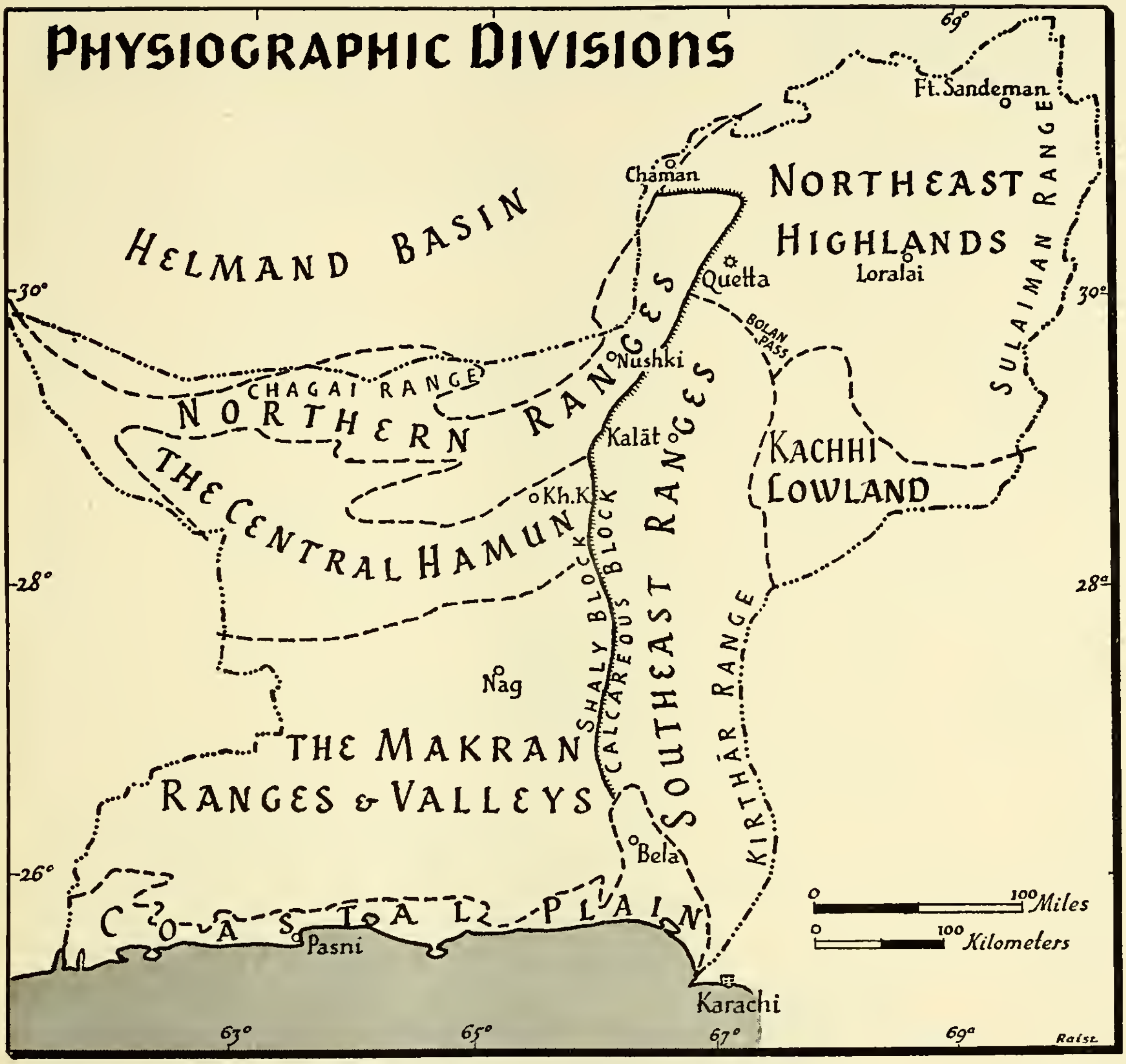

Fig. 4. Physiographic divisions of Baluchistan.

b) Toba Kakri (300 miles) forming the boundary between Baluchistan and Afghanistan.

c) Central Brahui (200 miles) occupying northern Jhalawan and entire Sarawan. There are 3 high peaks: Khalifat (11,440 feet); Zarghun (11,738 feet); and Takatu (11,375 feet).

d) Kirthar (190 miles) separating Jhalawan from Sind, with Zarkak (7,340 feet) as the highest peak.

e) Pab (190 miles) in the southeastern corner of Jhalawan and in Las Bela with Pharas (7,759 feet) at the highest peak.

f) Chagai (90 miles) in northern Chagai District consisting of scattered volcanic ranges, the chief being Koh-i-Sultan (7,650 feet), now an extinct volcano.

g) Ras Koh (140 miles) south of the Chagai Hills.

h) Siahan (175 miles) separating Makran from Kharan and uniting with the Jhalawan Hills.

i) Central Makran (250 miles).

j) Makran Coastal Range (280 miles) follows the Arabian Sea. Figure 4 has been compiled by Dr. Raisz from the most recent data.

In order to show the altitude above sea level of some important localities in Baluchistan, table 1 has been compiled.

TABLE 1. ALTITUDES[1] IN BALUCHISTAN

Locality	*Height*
Quetta-Pishin District	
Barshore	6,000
Bostan	5,139
Chaman	4,311
Gulistan	4,838
Hanna	6,000
Karez Inayatullah	4,838
Khanozai	5,500
Killa Abdullah	5,185
Killa Sakenkhan	5,700
Kuchlak	5,129
Pishin	5,300
Quetta	5,500
Sariab	5,590
Zhob District	
Fort Sandeman	4,700
Hindubagh	5,890
Kan Mehtarzai	6,900
Manikhowa	6,000
Killa Saifullah	5,084
Murgha Kibzai	5,000
Shingarh	8,500
Loralai District	
Baghao	5,400
Barkhan	3,650
Duki	3,600
Loralai	4,700
Musakhel	3,700
Naharkot	3,600
Rarkan	3,700
Sanjawi	5,350
Kachhi	
Bhag	334
Gandava	321
Jhal	348
Sibi District	
Harnai	2,952
Kachhi	6,359
Khost	2,234
Sibi	406
Usta Mohammed	400
Ziarat	8,050
Chagai District	
Dalbandin	2,785
Nokkundi	2,229
Nushki	2,341
Bolan Pass	
Mach	3,246
Spezand	5,856
Sarawan	
Kalat	6,783
Mastung	5,500
Jhalawan	
Khuzdar	4,050
Mashkai	4,120
Makran State	
Kuddan	1,192
Nasirabad	2,017
Panjgur	3,177
Pasni	10
Tump	2,179
Turbat	1,673
Kharan State	
Kharan	2,140
Washuk	3,078
Ladgasht	2,000
Las Bela State	
Bela	292
Ormara	15
Sonmiani	18
Uthal	152

RIVERS

There can hardly be said to be any rivers in Baluchistan. The streams partake of the nature of mountain torrents, and frequently disappear in the ground at various distances from their sources. Such is the termination of the Bolan and of many of the streams met with in the downward march from Kalat to the sea. This may be attributed to the very absorbent nature of the soil, and to the extensive system of irrigation carried out in a country where rain is scarce. The elevated region has 3 lines of drainage: (*a*) southerly toward the sea; (*b*) westerly toward the desert and Makran; and (*c*) easterly toward the Indus.

The waters flowing from Kalat form one of the principal tributaries of the Lora River, which they join in the Pishin Valley, whence flowing west and southwest toward the great lake of Seistan they are lost in the sands midway between Nushki and Chagai. Such also is the termination of all the minor waters flowing westward between Nushki and the sea. They are all absorbed in the desert, and have no apparent connection with Seistan Lake.

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[1] Feet above sea level. The heights given for Barshore, Hanna and Manikhowa are estimated.

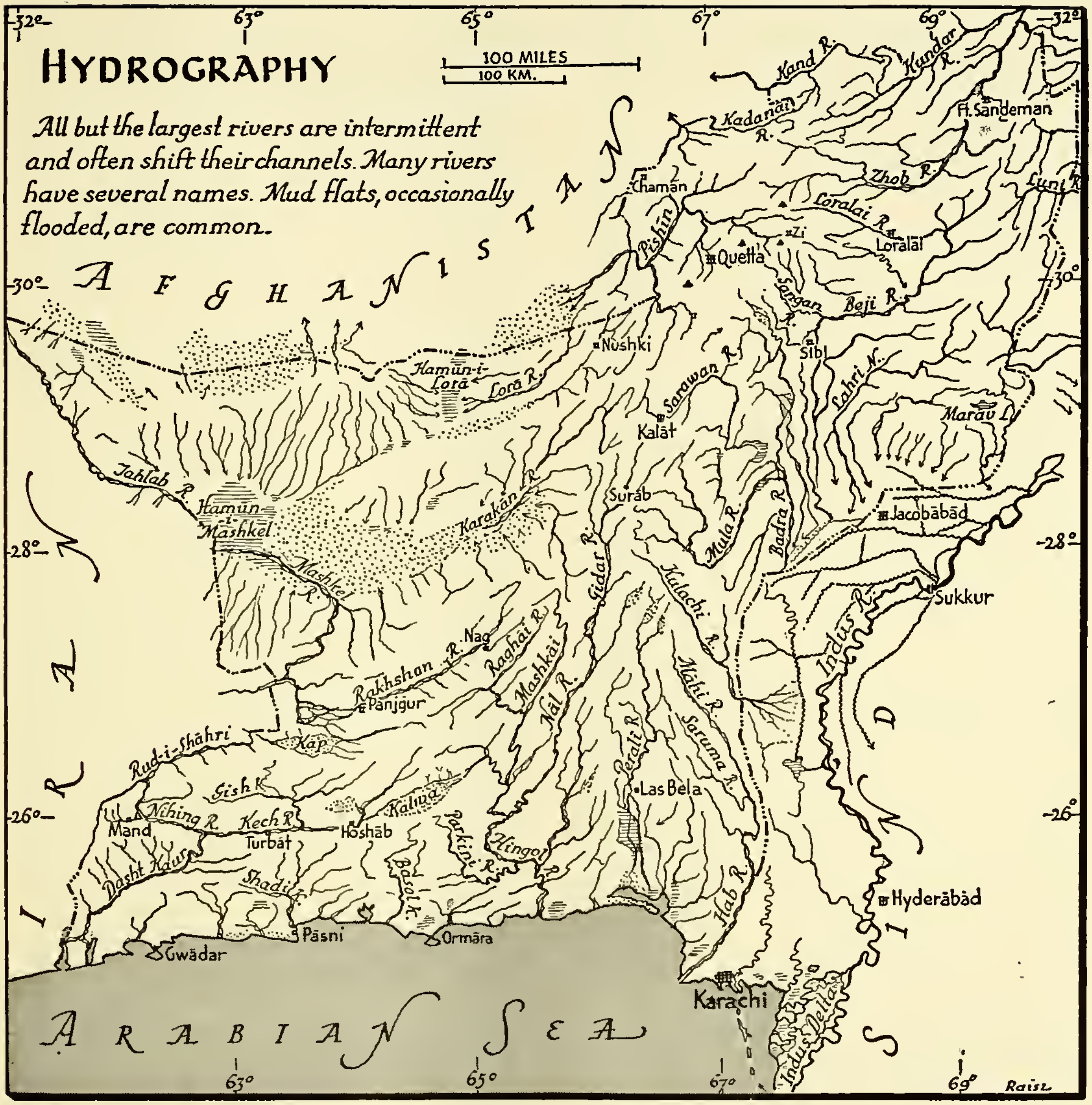

Fig. 5. Hydrography of Baluchistan.

The line of drainage eastward may be best described by a line drawn south-by-west from the Shal Valley to the parallel of Khuzdar, and thence by another line running along the course of the Baghwana River southeast to Manchar Lake, as all rivers flowing eastward within these limits seek the Indus. Below Khuzdar, however, and generally from the neighborhood of Wad for 20–30 miles south, the course of the principal rivers, the Purali and Urnach, is generally south and the confluence of both occurs at the town of Bela—the capital of Las Bela—whence under the general name of the Purali they fall into the sea a few miles west of Sonmiani.

The Hab, rising in the Pab Mountains south-southwest of Wad, pursues a southerly course and debouches into the sea about 20 miles west of Karachi. The Purali has a course of some 150 miles, which, like that of the Urnach, is usually dry, or filled only during the floods. The Hab partakes of the same character, although with probably a larger supply of water from springs, but in all cases the quantity is very limited and confined to occasional spots.

The chief rivers (fig. 5) are:

a) Zhob (240 miles) rises east of Pishin, the perennial stream first appearing 45 miles from its source. High banks for many miles prevent irrigation.

b) Nari (300 miles), also called the Anambar and the Beji, irrigates large areas of Sibi and Kachhi.

c) Bolan rises near Kolpur, but the water appears first at Sar-i-Bolan and disappears near Ab-i-Gum. At Bibi Nani, the Bolan is joined by the Sarawan River. A perennial stream flows from this point.

d) Pishin Lora (250 miles), with its source in the Toba Kakri Range, drains western Sarawan, part of Quetta-Pishin, Nushki and Shorawak in Afghanistan.

e) Mula (180 miles), rising in the Harbui Hills, drains northeastern Jhalawan and southwestern Kachhi.

f) Hab (240 miles) rises at the northern end of the Pab Mountains and flows into the Arabian Sea.

g) Purali or Porali (175 miles) drains southern Jhalawan and Las Bela on its way to the Arabian Sea.

h) Hingol (358 miles) drains western Jhalawan and northeastern Makran. From Kurragi southward the perennial flow passes through narrow gorges into the Arabian Sea.

i) Rakhshan (258 miles), rising near the eastern junction of the Central Makran and Siahan ranges, is joined by the Gwargo Stream and the Mashkel River and finally runs along the western side of Kharan into the Hamun-i-Mashkel on the western frontier.

j) Dasht (255 miles) drains southwestern Makran.

k) Other streams are the Bado, Basol, Jao, Laiari, Mashkel or Mashkid, Mulla, Nal, Sawar, Shadi Kaur, Surmasang and Urnach.

Districts and States of Baluchistan

The Province consists of 5 districts (Quetta-Pishin, Loralai, Sibi, Zhob and Chagai), the Bolan Pass and the States of Kalat, Makran, Kharan and Las Bela. A brief geographical description of the physical features of these Districts and States (fig. 1) follows:

1) *Quetta-Pishin District.* This lies centrally in the highland of Baluchistan. In the north rises the Khwaja Amran Range, which extends eastward to the Toba Plateau, separating Baluchistan from Afghanistan (Helmand Basin) and continuing as the inner frontier range to the Hindu Kush. The general character is mountainous, the mountains being intersected by long, narrow valleys. All the valleys exhibit similar features and consist of flat plains of alluvial soil in the center, with a pebbly slope of varying length rising on either side to the surrounding mountains. It is from these pebbly beds that the supply of water for irrigation is chiefly derived through artificial underground channels (*karezes*). The Quetta Valley is the most important in the District. The hill ranges are relatively uniform in character, consisting of long central ridges separated by innumerable gorges and torrent beds. They vary in elevation from 5,000–11,000 feet.

The climate is usually dry and, in general, temperate. The seasons are well-marked. Spring is the most delightful time of the year. The winter is very cold, with snow and biting cold winds. The summer is hot. Like other parts of Baluchistan, Quetta-Pishin lies outside the sphere of the monsoon currents and the rainfalls, which are scanty, occur mainly in the winter. The entire District is subject to strong winds.

2) *Loralai District.* This crescent-shaped District is bounded on the north by Zhob, on the west by Sibi, on the east by Dera Ghazi Khan (Punjab) and Dera Ismail Khan (North–West Frontier Province) Districts and on the south by the Mari and its adjoining country. It consists of a series of long but narrow valleys hemmed in by rugged mountains. In the southwestern and central parts lie a series of plains of which the most important is Thal Chotiali, which is so level and flat that it is described as having the appearance of an inland sea. Compared with the fertile valleys of Quetta, the greater part of Loralai can be said to boast little scenery. The soil consists of either reddish loam, gray loess or extensive gravel deposits.

The climate varies with the elevation, but in general is dry. In the west the seasons are well-marked; the summer is cool and pleasant. The winter is intensely cold with hard frosts and snow. In the south and east, the temperature is more uniform, but the heat in summer is great. Loralai lies outside the monsoon area and the rainfall is, therefore, light. In the western parts, rains occur both in summer and winter and there is some snowfall. The rest of Loralai depends chiefly on the summer rainfall which exceeds that of the winter.

3) *Zhob District.* Situated in the highlands, this forms the northeastern corner of Baluchistan. Zhob is bounded on the north and northwest by the North–West Frontier Province and Afghanistan. The eastern boundary is marked by the Sulaiman Range. The Loralai and Quetta-Pishin Districts border Zhob on the south and west, respectively. The greater part is covered with mountain ranges intersected by valleys. In the north lies the great valley of the Zhob River, the cradle of the Afghans and Pathans—an immense stretch of alluvial plain. The general characteristics may be described as barren hills and mountain ranges and vast open plains, where, in most cases, due to lack of water, cultivation is impossible. Rocks and stones, varying from the size of the gigantic boulders on the mountainsides to that of the small pebbles and shingle in the dry torrent beds, cover the greater portion of the surface. Zhob is intersected by hills in all directions.

The climate is dry and bracing during the winter months; that of the Lower Zhob somewhat enervating. The Upper Zhob and the highlands possess excellent climatic conditions. In the Lower Zhob, the heat is unpleasant and great diurnal variations of temperature are experienced in winter. As Zhob lies outside the monsoon area, the rainfall is scanty and varies with the altitude.

4) *Sibi District.* This is bounded on the north by Loralai, on the south by the Upper Sind Frontier District, on the east by the Dera Ghazi Khan District of the Punjab and on the west by Kachhi, the Bolan Pass and Quetta-Pishin District. No area in Baluchistan presents such strongly marked variations, both physical and climatic. The Sibi and Nasirabad *Tehsils* consist chiefly of a low alluvial plain, formed by the clay deposited by hill torrents. This area has no portion higher than 500 feet above sea level. The chief characteristics are its level surface, excessive heat in summer, and scanty and uncertain rainfall. The remainder consists of mountainous country rising in a series of terraces from the lower Sulaiman Hills to 11,000 feet. In the mountainous region there are narrow valleys, the principal being the Ziarat Valley. The soil of the plains is alluvium (*pat*); in the lower highlands it is sandy with clay, and gravel at the higher elevations.

The climate is generally dry, but the temperature is as varied as the physical aspects. The highlands are pleasantly cool in summer, extremely cold in winter. The plains suffer from the great heat common in the Upper Sind Frontier District, which has the unenviable reputation of being the hottest in the Indo-Pakistan region. Sibi lies outside the monsoon area and the rainfall is irregular and scanty. In the highlands, the greatest rainfall occurs during winter; on the plains, rainfall is greater during summer.

5) *Chagai District.* In the western corner of Baluchistan, this comprises that belt of the country which lies immediately south of the Indo-Afghan Frontier. Chagai is bounded on the north by the desert regions of Afghanistan, which lie south of the Helmand Basin; on the east by the Sarawan Province of Kalat State; on the south by Kharan; and on the west by Iran. The physical aspects are extremely varied, but the main features are sufficiently distinct to be classed as highlands, lowlands and deserts.

The lowlands, mainly the central portions, consist chiefly of a vast, alluvial plain interspersed with tracts of sand and intersected by a low range of stony hills. To the north stretches the wide, sandy desert, which is slowly advancing year by year and burying the alluvial plains to the south and west. The highlands include the northern, the eastern and southwestern regions. The peculiar characteristics of Chagai are the moving sand hills, the mirages which appear in the deserts, and the severe sandstorms.

On the plains, the seasons are unequally distributed. There is a maximum of hot weather and a minimum of cold; both are severe, and the transition from one to the other is short and sudden. The general conditions of Chagai are suited to pastoral rather than to agricultural pursuits. Owing to the peculiar formation of Chagai, the drainage finds no outlet to the sea, but in depressions shallow lakes or marshes (*hamuns*) are formed.

6) *Bolan Pass.* Situated in the northwestern part of Baluchistan, it is bounded on the north by the Quetta-Pishin District; on the east by Sibi; and on the south and west by Kalat State. The general character is mountainous, the entire area being intersected by long, narrow valleys. The scenery is devoid of everything except stones, rocks and sand-colored hills. The elevation varies from 463–5,856 feet.

7) *Kalat State.* There are three Provinces:

a) *Sarawan,* which forms the northern part of the two great highland divisions, meets Quetta-Pishin on the north; Jhalawan on the south; the Bolan Pass and Kachhi on the east; and Chagai and Kharan on the west. The general character is mountainous, consisting of a series of parallel mountain ranges, running north and south and enclosing valleys which consist mostly of alluvial soil in the center with a pebbly slope rising on either side to the surrounding mountains. The climate is generally dry and cold. There are distinct spring, summer, autumn and winter seasons. The rainfall is irregular and scanty and occurs generally in winter. Sarawan lies outside the sphere of monsoon currents, but is liable to strong winds. With the exception of a small area in the southwest, of which the drainage runs into Kharan, Sarawan ascends from north to south.

b) *Jhalawan* is for the most part mountainous, being intersected by valleys named after the rivers which irrigate them. The hills are of rocky, bleak and barren aspect. The seasons are well-marked. Jhalawan lies outside the sphere of the monsoon currents and the rainfall is irregular and scanty.

c) *Kachhi* forms the easternmost division and consists of a flat, triangular plain surrounded on the east and west by mountain ranges. The chief characteristics are its level surface, excessive heat in summer and, at times, its great scarcity of water. Except within the influence of irrigation or after rains, it is little better than a desert. The desert portion of the country is called locally *pat* and it is in these areas that a marked natural feature of the district, the mirage, occurs. The surface is of low elevation, no section being much higher than 500 feet above sea level.

The climate is excessively dry and, during the summer, is very oppressive. The seasons are not well-marked; in fact, only summer and winter may be recognized. The rainfall is extremely scanty. Dust storms occur frequently. The alluvial soil, in general, is extremely fertile where irrigation is possible.

8) *Kharan State.* This is situated in central and southwestern Baluchistan and consists of a wide, irregularly quadrilateral plain, surrounded by mountains. Kharan forms a basin into which drain the rivers and streams from surrounding mountains. Finding no outlet to the sea, the water becomes lost in the sand. The interior consists either of a gravel plain covered by a sea of rolling sand, interspersed with pebbly plains and verdureless tracts of hard, clay soil, or of large, alluvial areas bordering the upper courses of the rivers. Of the various areas, by far the largest are the desert tracts. The characteristic feature is the accumulation of the wind-borne sand, either in large masses which are advancing slowly across the plains, or in crescent-shaped dunes.

The climate is dry but healthy. Dust storms are experienced throughout the year. At times they are scorching and destructive. In summer, the heat is intense, but the nights are always cool. The winter is cold. Kharan is an area of extremely limited rainfall, which occurs only in winter. In Kharan there are a few streams, or rather mountain torrents, none of which is of any size or of a permanent nature.

9) *Makran State.* Bounded on the north by Kharan, on the east by Jhalawan and part of Las Bela, on the west by Iran and on the south by the Arabian Sea, Makran differs from other parts of Baluchistan in its possession of a relatively long seaboard, which, together with Las Bela, extends for 471 miles.

Inland, the general character of the country is mountainous (these mountains cover the largest area). Between the ranges there are a number of valleys. To give an idea of the physical nature of Makran, Sir Charles MacGregor (1882) wrote, "take one of those big brown stones one sees all over Baluchistan, which, looking as if they had just come out of a fire, very aptly represents Makran, and just put a few specks of green on it, and the picture is complete."

The coast extends in an east–west direction, its general lie being somewhat convex. Owing to the scanty rainfall, the salinity of the soil and the physical conformation of the country, it is almost entirely desert. There is little vegetation to be seen except here and there a clump of date trees. The country contains no lakes, but there are areas of closed drainage called *kaps;* these occur in Kolwa, Balgattar and Parom.

The coast has a moderate climate. The seasons are less marked than in the interior. Further inland is a zone of extreme dryness and great heat. The elevated valleys have a slightly more temperate climate. The rainfall is very scanty and uncertain with long periods of drought, at times extending for several years. In Makran, an arid, dreary, uninviting waste, little agriculture is practised.

10) *Las Bela State.* Situated on the southern coast of Baluchistan, this is bounded on the north by Jhalawan, on the east by Sind, on the south by the Arabian Sea and on the west by Makran. The eastern part is mountainous. The center, comprising the greater portion, is a triangular, level plain with its base on the sea.

Owing to the scanty rainfall and the salinity of the soil and physical conformation, the country along the coast is mostly an uninhabited desert, presenting a wilderness of hills and cliffs with swampy or arid clay plains. The vegetation is very sparse and consists of desolate scrub. Even in spring, no annuals appear to diversify the scenery, and the underbrush is remarkably similar in external appearance. Woody, stunted, thorny, less than 12 inches high with round, cushionlike outlines, bleached stems and few leaves, they look like skeletons of plants—gray ghosts of a vegetation which has perished of thirst.

In general, the climate is more salubrious than that of Makran. The coast has a more moderate and moist climate than the interior. Winter and summer are the only seasons. The rainfall is capricious, the greater part in summer, some in winter.

CLIMATE

Aridity is the principal characteristic of Baluchistan because of low relative humidity, great evaporation in summer and scanty rainfall. The rare heavy showers cause serious localized floods. Winter is far more tolerable than summer. Cold waves are common, with temperatures of 4° F. recorded at Nokkundi in Chagai and 7° F. at Kalat. At the other end of the scale, inland temperatures ranging from 100°–115° F. are not unusual. Thus, thermal continentality varies from 27.0 per cent on the coast to 67.0 per cent in the interior.

On the lower plains, there is a long, intensely hot summer and a moderate winter. In the high valleys, where the elevation varies from 3,000–6,000 feet, winter is very cold with snow and frost, but is followed by a glorious spring. The summer is moderately hot. The climate of the highlands is mild and pleasant in summer, which is reckoned to extend from April–September; but the winter is so rigorous that all who can afford to do so migrate during that season to the plains of Kachhi.

Great diurnal variations in temperature are characteristic of the climate. The hottest places in Pakistan are Dhadar, Sibi and Turbat; the coldest are Quetta and Kalat. Mrs. Azra A. Rahman Khan (1951) has written an article on the effects of climate in Quetta on human life.

The annual rainfall (fig. 6) is everywhere slight and varies from 3–12 inches. Most of the rain falls in connection with the cold weather depressions which sweep across the Iranian Plateau, but there are also some minor storms due to the monsoon currents. The rainfall in the highlands and in southern Baluchistan is mostly derived from the winter storms and is received in winter and spring. In the northeastern areas, the rainfall occurs mainly during July–August. The number of rainy days is extremely limited: Musakhel (36), Kohla (25), Quetta (24), Panjgur (10) and Bellpat (5). Years of drought are interspersed with years of heavy concentrated rainfall. The maximum recorded during 24 hours was 4.70 inches at Fort Sandeman in August, 1923 and 3.18 inches at Panjgur in January, 1926.

The normal amount of cloud cover in tenths at 0800 hours is 3.1 at Pasni, 1.7 at Panjgur and 2.1 at Quetta.

Thus, the climate of Baluchistan falls into the Desert Zone of the Iranian Plateau with characteristics of both the Monsoon and Mediterranean types, the result of its location on the Asiatic continent. The theory of desiccation

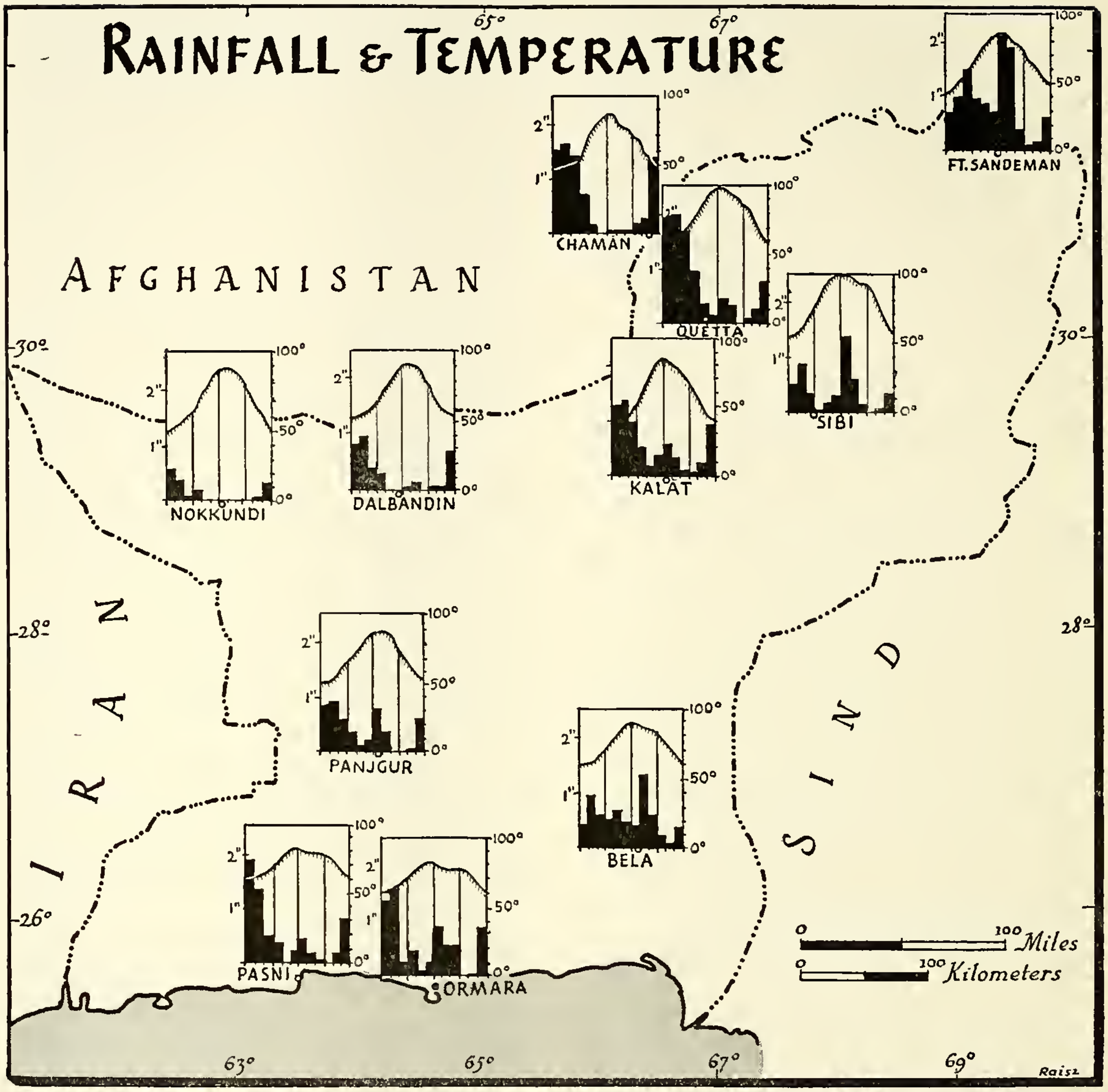

Fig. 6. Rainfall and temperature in Baluchistan.

may well be applied to Baluchistan (*see* Pithawalla, 1952b and Stein, 1945).

The Director of the Meteorological Service in the Geophysical Observatory in Quetta supplied certain climatological data. The stations selected were Pasni, Panjgur, Kalat and Quetta, since these were on our traverse. In addition, I requested similar data for Dalbandin and Nokkundi along the railway west of Quetta toward Zahidan (formerly Duzdab) across the Iranian Frontier. Table 2 gives the figures for Pasni, Panjgur, Kalat and Nokkundi.

TABLE 2. CLIMATOLOGICAL DATA ON BALUCHISTAN

Month	*Maximum*	*Minimum*	*Rainfall*	*Humidity*
		Pasni		
January	74.5	54.7	1.95	77
February	76.9	56.6	1.41	81
March	84.6	61.9	0.51	79
April	90.7	67.8	0.40	81
May	94.3	74.2	0.01	81
June	93.8	78.5	0.26	83
July	91.2	78.9	0.47	84
August	88.2	76.3	0.17	87
September	89.2	72.5	0.00	86

Month	*Maximum*	*Minimum*	*Rainfall*	*Humidity*
October	90.5	67.3	0.00	78
November	85.4	60.5	0.14	69
December	77.9	56.6	0.84	75
		Panjgur		
January	62.9	38.6	0.83	74
February	68.0	42.5	0.96	72
March	78.1	50.2	0.60	63
April	88.5	59.2	0.39	63
May	97.9	68.3	0.11	54
June	103.2	74.6	0.12	51
July	103.3	76.3	0.79	65
August	100.9	73.2	0.83	62
September	95.7	65.0	0.04	53
October	87.2	55.4	0.01	46
November	75.9	45.6	0.08	49
December	66.5	39.8	0.57	63
		Kalat		
January	49.5	25.9	1.31	70
February	52.8	31.2	1.39	68
March	60.7	36.0	1.05	59
April	71.0	43.5	0.56	56
May	83.0	52.0	0.20	44
June	90.3	57.7	0.19	40
July	91.1	62.2	0.60	47
August	84.0	48.5	0.09	44
September	84.0	48.5	0.09	44
October	75.3	41.0	0.09	45
November	63.7	30.6	0.23	48
December	55.3	26.1	0.94	64
		Nokkundi		
January	63.4	38.3	0.89	53
February	72.7	47.0	0.40	49
March	78.1	51.8	0.12	46
April	90.3	63.1	0.35	45
May	102.4	74.5	0.02	40
June	109.3	81.8	0.00	40
July	109.4	83.6	0.00	38
August	106.9	81.1	0.00	31
September	100.5	70.9	0.00	33
October	92.2	60.1	0.00	44
November	80.0	49.7	0.03	42
December	70.9	43.4	0.14	54

Meteorological data from Quetta (table 3) and Dalbandin (table 4) for 1946–50 were obtained. (*See also* Pithawalla, 1952a, Appendix II, A–L.)

In considering the climate of the districts in Baluchistan, the year may be divided broadly into the following:

Season	*Months*
Winter	December–mid-April
Transition	Mid-April–June
Monsoon	July–September
Transition	October–November

The climate of the Quetta-Pishin District may be regarded as typical of the uplands and of Chagai as typical of the plains and desert areas. A brief description of the climatic conditions of both these Districts follows.

A) *Quetta-Pishin District*

Winter (*December–mid-April*). During this period, on an average, 2 western disturbances affect this area per month, each causing unsettled weather for several days. During the intervals, the weather is generally very fine with a clear sky, good to excellent visibility and fresh northwesterly winds. Frosts occur very frequently at Quetta during December–February and are most severe at the end of a well-marked western disturbance when strong northwesterly winds blow from higher latitudes and cause 15°–20° F. of frost. With the approach of a disturbance, the normal northwesterly winds begin to back toward the south or southeast. High clouds then appear and gradually change to medium and low clouds, followed by rain in the plateau and snow on the hills.

The frequency of occurrence of comparatively large amounts of precipitation is greatest in the afternoon or evening. The period of disturbed weather and rain or snow with moderate to fresh and gusty southerly winds is generally more prolonged in the middle of the season and sometimes continues for several days. There is a marked diurnal variation of cloudiness with maxima in the early morning and afternoon. The maximum in the forenoon is remarkable, the skies clearing almost completely even on days of disturbed weather. Fog and mist occur on a few occasions, while toward the close of the season, afternoon disturbances make their appearance.

Transition (*Mid-April–June*). The western disturbances become gradually less frequent and begin to recede to higher latitudes. The weather becomes drier, with only 2 or 3 rainy days during the season. However, during the first half of the period, days with very light rainfall are fairly frequent, and occur on the average during 5–6 days. Rainfall during this transition season is more frequent in the after-

TABLE 3. METEOROLOGICAL DATA RECORDED AT QUETTA, 1946–50
(Altitude 5,500 feet)

Air Temperature

Month	*Mean Daily* *Max.*	*Min.*	*Mean Monthly* *Max.*	*Min.*	*Extreme* *Max.*	*Min.*	*Relative Humidity*	*Rainfall (Inches)*
January	50.2	27.6	65.6	16.7	78	9	79	1.94
February	53.6	30.8	67.4	20.4	80	12	78	1.98
March	63.6	38.3	75.9	26.8	84	15	69	1.74
April	74.0	45.8	84.2	35.0	91	27	64	0.98
May	83.8	51.9	92.4	42.7	98	34	55	0.39
June	91.6	58.7	97.7	49.3	100	43	55	0.17
July	94.0	65.0	96.0	56.0	102	45	57	0.46
August	92.2	61.6	97.1	52.0	100	45	57	0.33
September	86.2	49.7	92.3	39.6	97	33	53	0.04
October	75.7	38.9	84.1	30.1	91	22	52	0.12
November	65.4	32.1	72.1	23.4	81	18	58	0.28
December	55.5	28.5	67.0	18.6	76	12	75	1.01
Mean	73.8	44.1					63	
Total								9.44
Extreme					102	9		

TABLE 4. METEOROLOGICAL DATA RECORDED AT DALBANDIN, 1946–50
(Altitude 2,785 feet)

Air Temperature

Month	*Mean Daily* *Max.*	*Min.*	*Mean Monthly* *Max.*	*Min.*	*Extreme* *Max.*	*Min.*	*Relative Humidity*	*Rainfall (Inches)*
January	61.5	35.3	74.3	23.1	83	10	74	0.88
February	67.5	39.6	80.9	26.5	93	13	69	0.96
March	77.8	47.7	90.1	34.1	98	26	55	0.40
April	89.2	57.9	99.5	45.3	109	37	46	0.30
May	100.3	66.0	109.2	55.2	114	48	33	0.07
June	107.3	73.0	113.6	62.9	118	57	29	0.01
July	108.7	76.2	114.4	67.3	119	61	33	0.12
August	106.1	71.6	110.2	62.1	117	50	35	0.13
September	99.3	61.6	106.7	51.6	111	40	35	0.00
October	89.0	50.9	98.4	39.5	104	32	40	0.02
November	67.3	40.5	87.1	30.4	92	17	50	0.06
December	65.2	35.0	77.7	24.4	86	11	71	0.68
Mean	87.3	54.6					47	
Total								3.63
Extreme					119	10		

noons and evenings, and is often associated with thunderstorms or preceded by dust storms. Afternoon dust storms, which occur on about 3–4 days per month, cause marked diminution in visibility. The diurnal variation of cloudiness during this season is more or less of the same nature as during the winter period, except that the early morning maximum is not so well-pronounced. Ground winds at Quetta generally freshen and become gusty in the afternoon.

Monsoon (*July–September*). The effect of the southwest monsoon is usually slight, and prolonged unsettled weather with overcast skies and rain rarely occurs in Quetta-Pishin and its neighborhood. Rainfall during this season is generally attended by thunder and lightning. The weather is usually fine or fair in the mornings with a clear to partially clouded sky. The disturbed weather is generally confined to the afternoon and evening hours. Occasionally, however, a monsoon storm or a depression originating in the Bay of Bengal continues its westward march beyond Rajputana and travels through Sind and Baluchistan into the Persian Gulf. On such occasions, the weather sometimes continues disturbed and rainfall occurs more or less continuously for a day or more. Dust storms occur occasionally in the afternoon and evening hours.

Transition (*October–November*). This is the most settled period and the weather, on most days, is very fine with a practically clear sky and good to excellent visibility. The total rainfall of about half an inch occurs during the 2 months under the influence of occasional western disturbances, the normal number of rainy days being only 1.5 during this period. Dust storms are of rare occurrence.

Meteorological data recorded at Quetta, 1946–50, are given in table 3.

B) *Chagai District*

Winter (*December–mid-April*). The frequency of disturbed weather with precipitation is nearly the same as in Quetta-Pishin, but usually the disturbed conditions are less prolonged, the amount of precipitation being less than that in Quetta-Pishin. The frequency of very low clouds appears to be less than in the Quetta District, and visibility, especially during the first half of the period, is generally good to fair. During the second half, however, weather conditions often assume the characteristics of the following transition period, and strong dust-raising winds or dust storms and thunderstorms with light showers sometimes cause poor visibility in the afternoons.

Transition (*Mid-April–June*). This season is characterized by the frequent occurrence of strong dust-raising winds from forenoon until afternoon when visibility is often fair or poor. The area receives very little rainfall during the second half of the period, when disturbed conditions usually manifest themselves as dust storms or dry thunderstorms. The mornings are usually fine with a clear to partially clouded sky with only occasional dust-haze.

Monsoon (*July–September*). Rainfall occurs occasionally in the eastern areas when a depression of the monsoon season actually travels through Baluchistan or is active over the adjoining areas to the east. In the western half of Chagai, the weather is usually dry during this season. The steep pressure gradient caused by the intensification of the seasonal low over Sind and Baluchistan often causes strong winds which make the afternoons extremely dusty. The frequency of dust storms over this area appears to be greater than in other parts of Baluchistan during the period July–September, but it is believed that these dust storms are usually more in the nature of strong dust-raising winds than of dust squalls.

Transition (*October–November*). The weather is generally very fine with a clear sky and good to excellent visibility. On a few occasions, however, a fairly active western disturbance affects this region and causes cloudiness and light precipitation. In the western region, October is usually dry, and the rainfall that occurs during this season is generally restricted to November. Turbulent phenomena, such as dust storms and thunderstorms, are extremely rare.

The meteorological data for 1946–50 recorded at Dalbandin (Latitude 28° 54′ North, Longitude 64° 26′ East) are given in table 4.

WATER SUPPLY

This low rainfall is almost entirely responsible for the barren appearance of the land, the lack of water and the resultant hardship to the inhabitants.

In addition to the natural springs, the *karez* forms the principal source of water. This is a tunnel dug into the slope near foothills which penetrates the water table and brings water by gravity for irrigation and domestic use.

There are wells and tube-wells, temporary and permanent dams or weirs across *nallahs*, but almost everywhere throughout Baluchistan the water shortage is a constant problem (*see* Kazmi, 1949; Asrarullah, 1954a; and Nunn, 1954). Each well costs about Rs. 500 and may irrigate from 5–10 acres.

In addition to the above, there are canals, reservoirs and the use of floodwaters.

The influence of structure and texture of rocks on the water supply is given by Pithawalla (1952a, pp. 15–17), who also contributes (1952a, pp. 8–10) the following data:

> In the Administered Areas the following were recorded in 1908: 1,803 natural springs (*chashmas*), 493 *karezes*, 132 streams and canals and 76 wells.
>
> Aridity has been caused by tribal rivalries

which have brought about overgrazing, forest-cutting and consequent soil erosion.

The main sources of irrigation are: rivers and streams and canals only in Sibi District and the Pishin subdivision of Quetta-Pishin District; springs, common in the highlands; wells, found on a small scale; the *karez* (*kahn* in Makran), common in the highlands; and the open channel (*kaurjo*).

Flora

The hills are mostly denuded and for the greater part of the year have an extremely barren appearance. In the spring, however, the central and northeastern hills are covered with herbaceous plants, including Cruciferae, Leguminosae, Compositae, Boraginaceae and Liliaceae.

Ranunculus falcatus is one of the first small plants to appear in spring. *Iris* spp. is relatively abundant both on the hills and in the valleys. *Tulipa chrysantha* is abundant everywhere and in deep soil *Bongardia rauwolfii* is one of the common early plants growing up to 7,000 feet. The most striking plant in the spring is *Sophora griffithii*, which is found even up to 8,000 feet. On the lower slopes *Convolvulus leiocalycinus*, a stiff, spiny shrub, is characteristic of the more stony ground. Later in the season, *Sophora alopeuroides* covers large areas wherever the soil is deep. Two species of *Artemisia* are exceedingly abundant in late summer. From 5,500–6,000 feet *Ephedra* covers many hills. Wild almond and willow are quite common on certain hills. Tamarisk grows abundantly beside streams. *Alhagi camelorum* covers mainly the valleys between the hills. *Paganum harmala* grows in great profusion on most of the hills. A species of wild garlic (*Allium* sp.) and *Suaeda fruticosa* are also common.

In the saline soil, very frequent toward the west, *Artiplex leptocloda*, *Suaedae*, *Salsola lanata*, *S. verrucosa* and *Halocharis sulphura* grow luxuriantly. On the plains *Calotropis gigantea*, *Zizyphus jujuba*, *Lepidium draba*, *Portulaca oleracea* and *Salsola suaeda* are found. Various kinds of grasses grow, some quite abundantly. The most important are *Stipa capillata*, *Cymbopogon* sp., etc.

In towns, much has been done in planting avenues of various species of *Populus* and *Salix;* also *Platanus orientalis* and mulberry are found beside the roads.

The south and southwestern parts of Baluchistan have generally similar vegetation, which consists of an ill-favored, spiny scrub and such species as *Capparis aphylla*, *Salvadora oleoides*, *Zizyphus jujuba*, *Prosopis spicigera*, *Acanthodium spicatum*, *Tamarix articulata;* several species of *Acacia* are common. On the hills and rock formations, a thorny shrub (*Stocksia brahuica*) grows abundantly. On the gravel and clayey plains, the vegetation is extremely sparse and stunted. *Alhagi camelorum* is widespread in certain tracts where it grows luxuriantly and in dense masses.

On the sand dunes and between the hillocks formed by the sand waves, the vegetation is more general and of stronger growth than one would expect to find on first seeing this formation. The characteristic shrub (*Haloxylon ammodendron*) is quite common in these localities. *Tamarix macrocarpa* and *T. articulata* grow in luxuriance on these sand hills. In some localities, the sand dunes are covered with *Euphorbia* spp., *Tribulus alatus*, *Cyperus pungens*, etc.

In the stream beds, apart from tamarisk, the most frequent plant is oleander. Grasses are also common, but grow only in certain places; those which flourish are *Eragrostis*, *Aristida* and *Aeluropus*.

In a country so remarkably sterile as Baluchistan, a great supply of indigenous timber cannot be expected. The forested areas (fig. 7) cover 2,200 square miles. Trees abound in the more remote and sheltered recesses of the mountains to the east of Shal, where a species of juniper cedar, called *apurs*, prevails. This yields good firewood, but the timber is not of much value for building purposes. The *chihilgaz* flourishes in the Shal Valley, and for some distance further south, but the tree seldom exceeds 16 feet and yields no building timber. Excepting the willow and plane trees, there are none cultivated that do not bear fruit, and among these the mulberry and the apricot, which are useless as timber, are the most common. Indeed, the very mode of planting, with trees huddled together in thick groves, stunts their growth and renders them of little value as timber.

Junipers (*Juniperus macropoda* Boiss. and

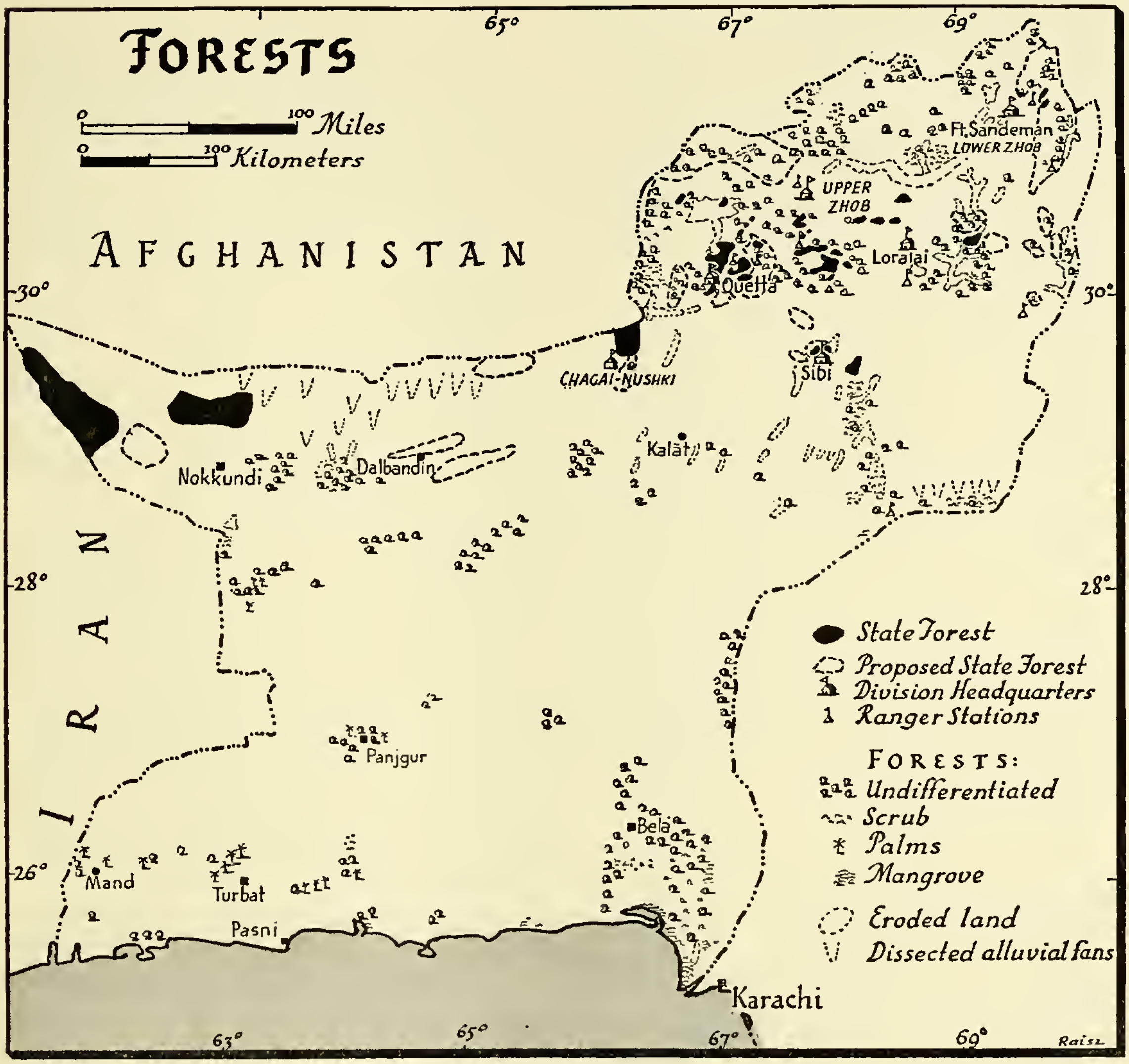

Fig. 7. Forests of Baluchistan.

J. excelsa) are found from 6,500–8,500 feet, but more vigorously from 8,000–8,500 feet at places where favorable conditions, like a certain degree of moisture accompanied by limestone formation or limestone mixed with other stones, exist. They are almost gregarious and occur at clearly demarcated areas, which are mainly in Quetta-Pishin, Ziarat Valley and some parts of Loralai and Zhob. The juniper trees are mixed with underwood of *Prunus eburnea* and *Caragana.* Locally, the juniper is called *apurs* (*appurz*), *dhup, ghushki* or *shur.*

The pistachio tree (*Pistacia khinjuk* and *P. mutica*) comes next to juniper in importance and is found everywhere from 3,000–8,000 feet, where clay and sandstone outcrop. The growth is scattered and sparse, and the tree is extremely slow-growing. These trees, valued greatly for their fruit, are called locally *khakhar, karkar* or *kakar-singi.*

The edible pine (*Pinus gerardiana*), a moderate-sized tree, grows generally from 6,000–12,000 feet in Zhob. Its fruit is exported on a large scale. *Pinus excelsa,* a large gregarious tree, flourishes at 8,000–11,000 feet.

The wild olive (*Olea cuspidata*), a middle-sized tree, is found from 5,000–6,500 feet, particularly in the northeastern portions of the Province.

Ash (*Fraxinus xanthoxyloides*) is generally found mixed with pistachio, olive, junipers, etc., but is nowhere gregarious.

Acacia modesta grows on the steep slopes. It is a moderate-sized tree and grows readily in poor, sandy or rocky soils. The leaves and flowers form an excellent food for cattle, sheep, goats and camels.

The tamarisk (*Tamarix articulata* and *T. indica*) grows to a considerable height in the beds of rivers, both in the hill gorges and on the plains.

Asafoetida (*Ferula narthex* Boiss.) is found in considerable quantities in hotter parts and is from 1–2½ feet long and from 3–4 inches thick, and the leaves somewhat resemble those of the large Indian beetroot. It is called locally *hing, hingara, hingru* or *perungayam.*

The dwarf palm (*Nannorhops ritchieana*), a stemless, gregarious shrub, is found in considerable quantities on rocky ground up to about 3,000 feet in Chagai, Kharan, Makran, Las Bela and Sibi. There is hardly any purpose to which it is not applied by the people of the area in which it grows.

Among minor forest plants may be mentioned:

a) Cumin (*Cuminum cyminum* Linn.), a gregarious herb which grows wild above 7,000 feet after good rains and snow. The herb becomes green in early spring and about the end of March the stem appears and is followed by white flowers. The seed or fruit ripens when it is collected. The local names are *jeera, jeeraka* or *safed zira.*

b) Rhubarb (*Rheum emodi*), which grows in abundance in years of good rainfall, mainly in the central hill ranges, at about 5,500 feet. It is green in April and becomes fit for use in May.

c) Hyssop (*Hyssopus officinalis* Linn.), which grows abundantly in the hills following good rainfall, sprouts at the beginning of April and the herb is collected about the end of May. The local name is *zufah yabis.*

d) *Ephedra vulgaris,* the source of ephedrine, is by no means rare.

e) Baluchistan is rich in plants and herbs of medicinal value (*see* Dastur, 1950 and 1951).

Agriculture

Baluchistan includes tracts with very varied types of climate. The southeastern region, which is an extension of the plains forming the Indus Delta, is one of the hottest and the driest regions in the world, with a maximum temperature of 125° F. and an annual rainfall of 3–4 inches. The uplands in the north and northeast have a series of valleys from 3,000–8,000 feet separated by barren mountain ranges; the average rainfall varies from 4–12 inches annually.

Cultivation is practised wherever irrigation facilities are available in the form of perennial or inundation canals. Dry farming is mainly practised in a major portion of the cultivated areas, both in the hills and plains. In zones of summer rainfall, floodwater is utilized with great advantage; however, the main source of irrigation is the *karez.* The soils of the uplands are sandy loam or loam, whereas the lowland soils are mainly heavy clay with only a few exceptions of loam soils.

Large areas have less than 3.0 per cent under cultivation. The Nasirabad Tehsils of Jhatpat and Usta Mohammed on the Sind border are 80.0 per cent cultivated. In 1955, the Mastung area was being developed.

Agricultural lands are divided into: (*a*) *khushkaba,* dependent upon rain or snow; (*b*) *sailaba,* subject to flood cultivation; and (*c*) *abi,* with permanent means of irrigation from *karezes,* rivers and streams, springs or wells.

There are 2 harvests: *rabi* in spring, and *kharif* in autumn. The most important spring crop is wheat. Millet is the chief autumn crop on the plains and maize in the highlands. Mung oil seeds, tobacco and melons grow in large areas. Of lesser importance are barley, grain, rice and potatoes. Among the many fruits are grapes, apples, pomegranates, apricots, peaches and several varieties of almonds. Dates form the principal crop in Makran.

Deciduous and cucurbitaceous fruits are grown in the upland valleys. In the lowlands, citrus, mangoes, guavas and dates are cultivated in certain limited areas. The total area covered is about 12,000 acres.

Vegetable growing is confined mainly to the Quetta, Harnai and Mastung valleys and around Sibi. The total area is about 2,500 acres.

In order to present a summary of agricultural production, the data have been arranged by field crops, vegetables and fruits.

A) *Field Crops.* The principal *rabi* crops are wheat (*Triticum* spp.), barley (*Hordeum* spp.), and gram (*Cicer arietinum* Linn.). The *kharif* crops are *juari* (*Andropogon sorghum* Brot.), rice (*Oryza sativa* Linn.), *bajra* (*Pennisetum typhoideum* Stapt.), maize (*Zea mays* Linn.), sugar cane (*Saccharum officinarum* Linn.) and cotton (*Gossypium herbaceum* Linn.). Wheat is the principal crop of the uplands, while in the plains the *kharif* crops are more important, especially *juari* and rice. Sugar cane and cotton are grown on a very limited scale.

a) Wheat grows throughout the Province, both on the plains and on slopes. It grows in almost every kind of soil except alkaline clay. On the plains, wheat is generally cultivated on irrigated lands, while in the uplands it is sown mostly in rain-fed areas. Irrigated wheat is generally sown on the plains from the beginning of October to the end of December. On the hills, sowing is begun as early as the end of August and concluded by the middle of December. The harvesting period on the plains runs from the beginning of April to the end of May; in the hills, from the beginning of June to the end of August. The yield per acre for irrigated areas is 8–12 maunds; in rain-fed areas, 5–8 maunds. (N.B. 1 maund = about 25 lbs.)

b) Barley grows on those soils which are too light or too alkaline for wheat, and its sowing and harvesting periods in both the hills and plains are almost the same as those of wheat. It is cultivated on a large scale in Jhalawan (Kalat State) and is usually sown for fodder, but if seed is required, the crop is allowed to ripen after one or two cuttings. There are no special varieties and the yield is 6–8 maunds on poor soils and 10–12 maunds on good soils.

c) Grams are cultivated only in Sibi, mainly as a *rabi* crop in Nasirabad. They are sown from the middle of September to the end of December and the crop is harvested between the beginning of March and the end of April. Grams are grown on irrigated lands and flourish in soft, sandy soils. The yield is 8–14 maunds per acre.

d) *Juari* (*juwari* or *jowar*) is grown on hills and plains, being the major crop. It grows in sandy loams, loams, and loamy clays, thriving on the last. It is sown from the middle of April to the middle of August for fodder and from the middle of May to the middle of August for grain. In the hills, it is grown mainly for fodder, while in the plains for both fodder and grain. *Juari* grows best on land which has remained fallow for more than a year and a half. It gives fodder 2 months after sowing, but for grain the crop remains in the field for 4–5 months. The yield is 280–300 maunds of green fodder and 8–10 maunds of grain per acre. Exceptionally rich soils may yield 400 maunds of green fodder and 16–20 maunds of grain per acre.

In Baluchistan, rice is grown in Sibi and those parts of Makran where a continuous supply of water is available. It grows in loams, clay loams, and even in alkaline clays, provided water is plentiful. The seed is sown in the nursery from the middle of May until the middle of June; seedlings are transplanted from the middle of June to the middle of July. The crop becomes ready for harvesting 90–180 days after transplanting. Early varieties ripen in 90 days, medium in 110–120 days, and late in 150–180 days. The inferior varieties yield 20–30 maunds of paddy per acre, while the superior varieties yield from 16–20 maunds per acre. Where the irrigation is by inundation canals, it is common practice to sow field peas or gram as a *dubari* crop, which ripens without demanding extra irrigation. Such crops enrich the soil and also bring extra income.

e) *Bajra* is cultivated in Loralai and Zhob and in the States of Kalat, Makran, Kharan and Las Bela. It is grown mainly on soils too light for *juari* and flourishes on sandy and lighter soils. Sown from the middle of July to the middle of August, the crop is ready for harvesting after 3 months. The grain is the food of the poor; the stalks are eaten by cattle. The yield per acre is 6–8 maunds.

Maize is grown in both the hilly tracts and plains. On the uplands, it is planted for grain, while on the plains it is used chiefly as fodder.

Sown in May–June, maize is harvested in August–September. The yield is 8–10 maunds per acre.

f) Oil seeds, mainly *jhamba* (*Brucea sativa* Mill.) and *sarsoon* (*Brassica campestris* Linn. var. *dichotoma* Watt.), are grown only on the plains, particularly in Sibi.

g) Sugar cane, so far confined only to the Harnai Tehsil of Sibi, is grown on a very limited scale for local consumption. The area is about 45 acres, the yield being about 350 maunds per acre.

h) The chief cotton-growing areas of Baluchistan are Kachhi in Kalat and some parts of Makran. In 1932, with the opening of the Kirthar Canal from Sukkur Barrage, cotton was also introduced into the Usta Tehsil of Sibi. During 1937–38 about 2,500 acres were under cotton, but since 1942, its cultivation has been restricted to a very great extent. In Nushki Tehsil of Chagai, some cotton was also grown (about 100 acres every year) until 1941, but it has now been completely abandoned.

In Makran, cotton of the type *Gossypium herbaceum* var. *typicum*, is grown mainly in the valleys of Dasht, Kach and Kulanch on suitable soils. It is generally sown from February–March, but owing to the uncertainty of rain, this period is not rigidly followed. Whenever there are rains, whether in summer or winter, cotton seed is dibbled. It is usually sown mixed with *juari* or other crops. In this region, cotton depends mainly on rain water or flood irrigation. The plants are allowed to stay in the field even up to 6 years. In years of rainfall, however, there is no alternative than to ratoon the crop. The period of flowering varies from May–June and the boll formation takes place 10–15 days after flowering. In case of a ratoon crop, flowering and boll formation take place earlier. The picking period lasts from the end of July until October; usually 4 pickings are made each season. The yield per acre varies from 200–375 pounds per season.

In Kachhi, cotton grows best on light, loamy soil which is mixed with a proportion of sand; this is known locally as *mat*. Cotton cultivation in this area depends on flood irrigation. The floods generally occur in July and August, sometimes also during the spring. If floods occur in March, cotton seed is broadcast immediately thereafter. The normal time for sowing is from February–March. Picking is done during October–November. The average yield is about 200 pounds per acre.

B) *Vegetable Cultivation.* Arranged in the order of their importance are the following: melons, potatoes, chillies, onions, spinach, turnips, carrots, peas, cabbages, cucumbers, tomatoes and radishes.

Melons and other cucurbits, particularly watermelons and muskmelons, are grown on an extensive scale from 4,000–6,000 feet, although one variety is found on the plains. Potatoes form one of the main crops on the uplands from 5,000–7,000 feet. They are produced both for local consumption and for export. The seed is imported. There are 2 main varieties: one sown in March–April and harvested during June–July; the other sown in April–May and harvested from August–October.

The other more important vegetable crops, including chillies, onions, peas and tomatoes, are all grown on a limited scale. During recent years, however, a great impetus has been given to vegetable cultivation, which is considered to be very profitable in Baluchistan since the climate is most suited for producing vegetables of good size and higher yield per acre as compared with those produced elsewhere. The lowlands at Sibi and Harnai ensure a continuous supply of vegetables during the winter months. The vegetables produced in other parts of Pakistan do not offer serious competition to those produced in Baluchistan.

The climate of Quetta Valley is eminently suited for vegetable seed production, because it combines the cold climate with less rainfall during the seed maturing season from May–August. Accordingly, the production of vegetable seed has developed and European seeds are raised on a large scale.

C) *Fruit Culture.* This is one of the main industries of Baluchistan with very great possibilities of future development. Below 3,500 feet, oranges, loquats, crabapples and a few varieties of pears and early peaches are found. In the upland valleys, all types of deciduous fruits such as apples, apricots, almonds, grapes, plums, pomegranates and peaches are grown.

At elevations from 3,500–4,500 feet, figs, pomegranates, almonds and apricots are cultivated. The major fruit-growing tracts lie between an elevation of 4,500–6,000 feet and commercial grape-growing is confined exclusively to these regions. Above 6,000 feet, the winter is very severe and spring frosts are very common. In these regions, apples, pears and certain types of apricots are grown.

The layout of the railways has considerably influenced fruit culture. The soft fruits such as peaches, table apricots and plums, which require ready marketing, are grown near the railroads. Hardy fruits such as apples, pomegranates, almonds and drying apricots are commonly grown in the interior.

The deciduous fruits include: almonds (*Prunus amygdalus* Stokes); apples (*Malus sylvestris*); apricots (*Prunus armeniaca* Linn.); cherries (*Prunus cerasus* Linn. and *P. avium* Linn.); figs (*Ficus carica* Linn.); grape vines (*Vitis vinifera* Linn.); peaches (*Prunus persica* Stokes); nectarines (*Prunus persica nectarina* Schneid.); plums (*Prunus communis* Hudson); pomegranates (*Punica granatum* Linn.); quinces (*Cydonia oblonga* Mill.); pistachios (*Pistacia vera* Linn.) and walnuts (*Juglans regia* Linn.).

The almond, a hardy tree requiring little water, is found throughout the uplands, especially in Loralai. Almonds, being of diverse types, are classified commercially into sweet and bitter almonds; these are further divided according to the thickness of the shell into: (*a*) paper-shelled (*romali*); (*b*) thin-shelled (*kaghazi*); and (*c*) thick-shelled (*katha*). The bitter almond is the most popular stock for stone-fruit trees.

Apples, now becoming more popular, are grown almost everywhere on the uplands. Seven types of apple are found, of which *kulu*, *kandahari* and *kashmiri* are the commercial varieties. *Kulu* is the leading winter apple, being highly esteemed for its flavor and keeping quality. Apples are mostly budded on suckers of local crabapple (*shaker seb*).

Apricots are found throughout the uplands, from the lowest to the highest elevations, and, in fact, there is no orchard without apricot trees. Twenty-four varieties are found, of which the local white apricots (*charmaghz*, *sardai* and *nari*) are popular for table use. *Shakarpara*, the white apricot used for drying in Kandahar (Afghanistan), is grown on a limited scale. *Shaghali*, a yellow variety, is used for drying in halves; its sweet kernels are utilized as a substitute for almonds in confectionery. *Large Red* and *Luizet* are good canning varieties. Apricots are invariably budded on apricot stock; this is also used in some localities as a stock for other stone-fruit trees.

Four varieties of cherries, 2 of figs, and a number of varieties of pears are grown on a limited scale for local consumption. It is estimated that there are more than 300,000 grape vines in the Quetta-Pishin District. About 19 varieties of grapes are grown, 2 of these (*haitha* and *spin kishmish*) being grown for export. One variety grows wild in the Barshore Hills of the Quetta-Pishin District.

Some 18 varieties of peaches are produced, the majority being used for dessert purposes. *Sims*, an exotic peach, has proved best for canning. The main peach-growing tract is in the Quetta-Pishin District.

There are about 24 varieties of plums, 6 of them (*Alucha*, *Alubokhara*, *Yellow Drop*, *Santa Rosa*, *Greengage* and *Victoria*) being grown on a large scale for export.

Pomegranates are grown chiefly in the Quetta-Pishin District, Loralai District and Jhalawan Province of Kalat State. Five varieties of pomegranates (*kandahari*, *jhalari*, *boriwal* [*khoze*], *beedana* and *trush*) are known. The last-named variety is used for making *anardana;* the others are grown for dessert use and juices.

Pistachios, quinces and walnuts are grown on a limited scale for local consumption.

Bush fruits, such as strawberry (*Fragaria vesca* Linn.) and raspberry (*Rubus* sp.), are grown on a very small scale in private gardens only in the Quetta-Pishin District.

Melons and other cucurbits, particularly watermelons (*Citrullus vulgaris* Schneid.), locally classified as *sarda* and *gharma*, are grown on an extensive scale between an elevation of 4,000–6,000 feet, although the variety *kharbooza* is also found in the plains. While *gharma* and *kharbooza* are grown for local consumption, the *sarda* is mainly exported.

Dates (*Phoenix dactylifera* Linn.) are grown in Makran along the banks of the rivers and are par excellence the crop of that area. For example, in the Panjgur oasis and neighborhood, dates form the main means of subsistence. These are also found in Kharan State and some parts of Jhalawan in Kalat State. Dates constitute the staple food of the inhabitants, but a large quantity is also exported. There is a large variety of dates (*see* Appendix N).

The chief fruits found in the plains are: citrus tangerine (*Citrus nobilis* var. *reticulata* Swingle); Seville orange (*Citrus aurantium* Linn.); lemon (*Citrus limonia* Osbeck.); sweet orange (*Citrus sinensis* Osbeck.); grapefruit (*Citrus paradisi* Macf.); mangoes (*Mangifera indica* Linn.); guavas (*Psidium guayava* Linn.); and loquat (*Eriobotrya japonica* Lindl.). These are grown on a limited scale up to 3,600 feet. Mangoes are found only in Turbat and in the Kulanch Valley of Makran and Nasirabad in Sibi. We saw several fine mango trees in the District Commissioner's garden in Turbat.

Table 5 gives the acreage under important fruits and their approximate annual yield during 1949. These figures were supplied to Dr. Nazeer Janjua by the Assistant Marketing Officer, Quetta.

TABLE 5. ACREAGE AND YIELD IN BALUCHISTAN, 1949

Fruit	*Acres*	*Maunds*
Almonds	302	7,500
Apples	993	57,440
Apricots	719	85,800
Cherries	5	220
Grapes	2,527	143,020
Peaches	80	11,700
Plums	108	18,120
Pomegranates	504	71,040
Melons and other Cucurbits	2,898	297,840

CHAPTER II

MAKRAN STATE

IN GENERAL terms, Makran is bounded on the north by the Siahan Mountains, which separate it from Kharan, on the east by the Jhalawan country and part of Las Bela State, on the west by Iran and on the south by the Arabian Sea.

Makran State became part of former Baluchistan (Balochistan), which for many years was the western buttress of the Indian Empire. Sir Denys Bray (1913b, pp. 9–10) described western Baluchistan in the following words:

> From a bird's-eye view the general impression would probably be a chaotic jumble of mud-coloured mountains, for all the world like a bewildered herd of titanic camels. . . . But the maps are crammed full of unconscious irony; and if you come to the country after poring over these elaborate patchworks of well-defined rivers, refreshing oases of green, and named localities innumerable, small wonder if you condemn it on sight as a land of rivers without water, of forests without trees, of villages without inhabitants. Yet you have only to scratch the soil and add a little water, and you can grow what you please. But often enough nature is so perverse that where there is land, there is no water, and where there is water there is no land. . . . Yet among those who have sojourned long enough in Baluchistan for their first impressions to fade away, there are few who have not fallen under the mysterious spell cast by this wild country and its inhabitants.

ORIGIN OF NAME

Makran consists of 2 political divisions, to which the word Makranat (= the Makrans) has been applied: Persian (Iranian) Makran; and Kech Makran in West Pakistan. The derivation of the word Makran has been much discussed. Modi (1904) wrote that Hamzah gives it as a contracted form of Mah Keran, from *mah* = town on the edge of the *keran* = sea.

Some Arab writers derive the name from its alleged founder, Makran, son of Farek, son of Shem, son of Noah.

Others consider it a corruption of the Persian *Mahi khoran* ("fisheaters"), the same name as that given to the coastal inhabitants by the Greeks of Alexander's army, who called them "Ichthyophagoi."

Curzon (1892, vol. 2, p. 261, footnote) believes Makran to be a Dravidian name and that it appears in a tribal list as Mokara in the "Brihat Sanhita" of Varaha Mihira.

Sykes (1921) connects Makran with the Sanskrit word *aranya* or *irinya* meaning waste or swamp and suggests *Maka irina* (= the waste of Makran). In Sind the modern pronunciation is Makaran, exactly the expression of *Maka irina.*

MOUNTAINS

Mountains, running east–west, dominate the inland part of Makran. The 3 main ranges, from south to north, are: (*a*) Makran Coastal; (*b*) Central Makran; and (*c*) Siahan.

Following the same geographical sequence, the valleys of the coastal division rise to about 200 feet and include Gazdan, Kulanch, Gwadar and Gwadar-e-Nigwar, and Dasht and Nigwar in the Dasht Valley.

The central division consists of the Kech Valley from Mand to Oshap, lying at an elevation of 500 feet with the subsidiary valleys of Buleda and Balgattar and the Kolwa Plateau about 500 feet higher.

The northern division consists of Panjgur and the Rakhshan, Gwargo and Raghai valleys and the little basin of Parom. The elevation varies from 3,000 feet on the west to 4,500 feet on the northeast.

The coast line has scanty rainfall and, because of the salinity of the soil and the physical conformation of the country, this region is desert or wilderness. Here the arid clay plains, impregnated with salt, are intersected by watercourses. From these plains rise precipitous table-hills with fantastic pinnacles, varying in height from 20–2,000 feet. There are many bays dominated by promontories and peninsulas of white clay cliffs capped with coarse limestone or shelly breccia—all tending to be flat-topped. The intermediate coast is low with white sand hills with bushes and grassy tufts or strips of low sand and extensive salt water and mangrove swamps. The average rise and fall of the tide is about 8 feet. The bays with the best ports are Pasni and Gwadar, the latter under the jurisdiction of the Sultan of Muscat until August, 1958.

The Makran ranges consist of successive ridges cut by torrent beds (*sheps*), which are dry except after floods.

a) The Coastal Range, 35–70 miles wide and known as the Bahrigarr, skirts the Arabian Sea for 280 miles between Latitude 25° 22′ and 26° 0′ North to Longitude 61° 44′ and 66° 3′ East. The eastern margin touches the Hala Hills, which bound the Las Bela Plain; near the 64th parallel there is a bifurcation, the main mass running southwest into the Talar-e-Band Ridge, which ends abruptly at Sunt-Sar above the Dasht River. The other arm continues west from Tal-e-Sar, south of Oshap, to the Gokhprush Hills, which form the southern boundary of the Kech Valley. These hills run westward across the Dasht River into Persian (Iranian) Makran. The Coastal Range consists of light gray clay or marl, sometimes intersected by gypsum veins. With this clay, bands of shelly limestone, calcareous grit and sandstone are interstratified. At Pasni the main mass extends southward to the sea.

At the northeastern end of the Coastal Range rises the tableland of Dhrun with its highest peaks of Shak (5,177 feet) and Gamoi Buri (3,871 feet). This flat area (30 x 9 miles) is accessible by 3 routes: (*a*) the Mazanrah from the northeast; (*b*) the Chiliki from the east; and (*c*) the Shak from the west. On top an irregular alluvial flat area, irrigated by the Dhrun-e-Kaur, is cultivated by a few Ormari Bizanjaus. Sind ibex, mountain sheep and bears live on this mountain. In ancient times, Dhrun was a refuge for outlaws.

To the south of Dhrun lies Rodeni Kach (4,193 feet) and further south are the long ridges of Goran-Gatti (4,181 feet) and Taloi (3,022 feet). Westward rises a confused mass of ridges with a line of peaks ranging from Darwarai-Burzaq (3,125 feet) to the end of Sunt-Sar (587 feet).

The Gokhprush Hills have peaks, flat tops or plateaus. The principal summits include Janzat (4,345 feet), Mukh (3,986 feet) and Khudaband (1,315 feet). Nummulitic limestone dominates the western end.

b) The Central Makran Range (250 x 45 miles) divides the valleys of Raghai, Gichk and Dasht-e-Shahbanz on the north from the Kolwa and Kech valleys to the south. To the west rise the Bampusht Hills separating Raghai and Gichk from the Rakhshan Valley. The Koh-e-Patandar forms the eastern extremity. The highest peaks are Zung (7,490 feet) and Rahat (7,100 feet), both west of Mashkai. The western part consists of shales and thin sandstone bands. The former are often slaty and almost schistose, with frequent veins of carbonate of lime; the latter, occasionally ferruginous, are massive with some argillaceous conglomerates.

The hilly tract between Nazenagan and Hung in Persian Makran with such peaks as Zirruki (4,242 feet), Machi (4,453 feet), Hishar (4,578 feet) and Buzap (4,270 feet) is called Zamuran from a local creeping plant (*zamar*). Many springs (*kallags*) supply water to the main village of Siah Gisi and others such as Gwanzagan, Momich, Sorag, Darapkan, Badui, Kuinbi-Kallag, Siah Kumb and Tezgaran. Here grow olives, wild almonds, willows and wild figs and asafoetida as well as many medicinal herbs. On terraced fields wheat, barley, *zurrat*, onions and a little tobacco are grown, as well as small quantities of pomegranates, apples, plums, grapes, figs, oranges and limes.

All branches of the principal river of the Makran system, the Dasht, have their sources in the Central Makran Range. The Nihing drains the northern slopes of the Zamuran Hills, the Gish Kaur, the Buleda Valley, and the Kil Kaur that of the country further east. In the northeast the main streams are the Doraski, the Gichk and the Raghai.

The only game are the Sind ibex, mountain sheep (*gurand*), a few bears and an occasional leopard. The Nawab of Makran, with headquarters in Turbat, presented Mrs. Field with the skin from a large leopard which he said had been killed a few weeks prior to our visit. This specimen is now in the Museum of Comparative Zoology, Harvard.

c) The Siahan Range separates Kharan from the valley of the Rakhshan River and disappears westward across the Persian (Iranian) frontier. There are 2 ridges: (*a*) northern, running from the desert east of Washuk in Kharan westward toward Dizak in Persia, where it is called the Siahan or the Siahan Kuh; and (*b*) southern, which extends 176 miles west–southwest from a point near Shireza.

The eastern end is called Band or Kharan-Rakhshan Lath. To the north and west of Panjgur it is termed the Koh-e-Sabz, which is only well-defined west of the Korkian Pass, whence it rises to 5,400 feet before reaching the defile known as Tank-e-Grawag. On the other hand, the Kharan-Rakhshan Lath descends gradually toward Jangaja-e-Gajiun in Panjgur and forms the hilly country between Panjgur and the Koh-e-Sabz, which is composed of shale and volcanic rock contorted into synclines and anticlines. The peaks are Razak (6,758 feet), Mughal Pabb (5,979 feet) and Choto-e-Jik (5,874 feet).

The Rakhshan tributary of the Mashkel River carries off all the drainage from the southern slopes. Hill torrents, such as the Gujjar, Regintak, Gresha Kaur, Palantak, Pilin, Bibi Lohri and the Barshonki, flow into the Kharan Plain or join the Mashkel River.

The Siahan Range supports no permanent inhabitants. Among the nomads, who pasture their flocks, are the Muhammad Hasnis, Nasrois, Bullozais, Sopaks and Hajizais of Rakhshan Valley and the few Siahani from Kuhak. In addition, the Rekis, Kuchai Siahpads and Taghapi Rakhshanis migrate from the Kharan Plain.

No forests exist, but many of the torrent beds support tamarisk, asafoetida and date palms.

RIVERS

1) The Gish Kaur drains the northwestern end of Buleda Valley and the western part of the Central Makran Range. The Gazbastan, Piri Kaur and Shetap form the principal affluents. The flow is not perennial throughout its course, but the Gish Kaur expands at short intervals into large, shallow pools, which irrigate the Buleda villages. There are some thick jungles of tamarisk, reeds and *kahur* inhabited by wild boar.

2) The Kil or Kul Kaur is supplied by many hill torrents, the principal being the Godirri, Zahm and Dor, which rise in the east between Goran-e-Kandag and upper Malar in Kolwa. The main stream is not perennial, but contains occasional pools, and is studded with tamarisk jungle. In some areas the tamarisk and *kahur* are dense with long, waving grass where wild boars thrive.

3) The Kech Kaur carries the waters of the Gish Kaur and Kil Kaur as well as the drainage from the Kech Band to the north and the Gokhprush Hills to the south. Near Sami the Kech Kaur is narrow and deep (35 feet), but near Turbat the width has increased to about 1.5 miles and the banks are not more than 6 feet high. This river is subject to high floods. About 1870, the populous town of Miri, capital of Kech, was destroyed, but the stream erosion has now moved to the southern bank. At Miri on the north bank there is a fine grove of date palms; otherwise, there is little growth except for a few stunted tamarisk bushes.

4) The Nihing, rising at Sar Parom, meanders between the Zamuran and Bampusht ranges to form the boundary between Kalat and Persian (Iranian) Makran. Turning southeast, it forms a delta west of Tump with large pools used for irrigation. Before reaching Aspikahn, the Nihing is joined by the Kulbar and Tagran, both famous for their rich pasturage. Another affluent, the Mandi Kaur, irrigates a considerable area near Mand. Near Sar Parom there are pistachio trees and, lower down, tamarisk and *kahur*. Along the upper reaches, the banks are precipitous, but at Tump the banks are 4 feet high and the river about 1,000 paces wide. Flooding has carried away many date palms in Tump.

5) The Dasht cuts through the Gokhprush Hills below Kaur-e-Awaran and falls into the Arabian Sea by a large creek, which is tidal for 12–15 miles. The river is not a continuous stream and fills only after rain. Pools exist perennially. After heavy rain, flooding occurs. Near these pools tamarisk and *kahur* (*Prosopis spicigera*) trees flourish. The average height of the banks is 25 feet, the width 200 yards.

6) The Shadi Kaur (50 miles) rises at a water-parting southeast of Jamgwang, whence also the Daddai and Nilag flow westward. This river is soon joined by the Pidarak (Pidark) stream. A larger tributary is the Bahri Kaur, which rises on the southern slopes of the Gokhprush Hills, and joins the Shadi

Kaur near Gulumani Bent, a halt on the road from Pasni to Turbat. From the confluence, the united streams flow southward and, breaking through the Talar-e-Band Hills, fall into the Arabian Sea 2 miles northeast of Pasni. In the lower course, the Asi, Pacharo and Dasi join the Shadi Kaur from the east. Numerous other streams and hill torrents also flow into the river. The channel and banks support tamarisk, *kahur* and sometimes dwarf palms (*pish*). The flow is not perennial, but collects in frequent pools. Floods provide the inhabitants of Pasni with fuel in the form of floating trees.

7) The Basol (80 miles) rises in Kolwa to the south of Balor. Near the source, it is called Karpad Kaur, and lower down, the Chetrau. The main confluents are the Londo and Gorani from the west and the Suler from the east. The Basol flows between the high clay ridges of the Makran Coastal Range until it reaches the Arabian Sea 20 miles west of Ormara in Las Bela State. There are many perennial pools, the largest being at Siah-Dat, Abgir, Waqab and Koari. There is little vegetation and almost no cultivation.

8) The Rakhshan rises at the Nadoki Pass, southwest of Shireza; here it is called the Nag. It flows southwest, united with the Lop Stream west of Nag-e-Kalat. The Rakhshan flows west–southwest through the center of the long valley, including the districts of Rakhshan and Panjgur, and parallel with the Siahan Range to the north and the Zangi Lak Hills to the south. In Rakhshan the river has little or no water, except a large pool at Nag-e-Kalat, from which 5 irrigation conduits flow. In Panjgur there are bright, clear pools connected by small channels. The banks are bordered with numerous large date groves. West of Panjgur, the Rakhshan River is joined by the Mazan Dashtuk from the west, by the Askani from the east, and by the Gwargo from the south. After traversing Panjgur, the main stream joins the Mashkel River near Tank-e-Grawag.

The banks of the Rakhshan are low, shelving and irregular, consisting of hard clay known as *kork*. In Panjgur there are 6-foot banks and the width is about 2,000 yards. Floods do little harm. The stream bed encourages a little tamarisk or grass. Quicksands exist.

9) The Gwargo rises at Gichk-e-Sargwaz, crosses through the Bampusht Hills and joins the Rakhshan west of Panjgur. The main tributaries are the Guzdaira, Gwani and Soran. Flowing west through soft soil with a broad, sandy bed, the banks of the Gwargo average 7 feet in height. Floods cause little damage. Tamarisk, dwarf palm, *kunar* (*Zizyphus jujuba*) and *kahur* flourish along the banks.

10) The Gichk (50 miles), which drains the southeastern slopes of Makran, rises at Gichk-e-Sargwaz and enters the Tank River before joining the Mashkai tributary of the Hingol. The banks are low. Vegetation, consisting of tamarisk and other trees, *kahur* and grass, flourish on the banks and in the stream.

11) The Raghai (60 miles) rises at the watershed south of the small basin of Kappar and flows southwest until it joins the Gichk at Tank West. The water is nowhere perennial, but there are many pools. The entire course of the Raghai Kaur is thickly covered with tamarisk, dwarf palm and grass. The stream bed affords shelter to caravans from the bitter blasts of the northwest wind (*gorich*) during winter.

12) The Tank (13 miles), below the junction of the Gichk and the Raghai, meanders southeast through the Patandar section of the Central Makran Range. There are some pools, the largest being Katti Gwarm, where the Panjgur Nakibs fish. Since the bed is only 50 yards wide, a flood would be dangerous. There are scattered tamarisks and dwarf palms.

KAPS

There are no lakes, but a characteristic feature consists of areas of closed drainage (*kaps*) in Kolwa, Balgattar and Parom (12 miles in diameter). The center is dry, but after heavy rain a shallow lake appears. The evaporated salt of dazzling whiteness delineates the area subject to inundation.

Persia (Iran) has several similar salt deserts. On August 8, 1934, I visited the Darya-i-Namak about 25 miles south of Tehran. Here there are patches of white salt overlying clay (Field, 1939, pp. 540–42). Later that month, with Dr. Donald E. McCown, I drove to Daryacheh-i-Maharlu, southeast of Shiraz. A sea of glistening salt proved to be about one inch thick, resting on a black, argillaceous stratum.

CLIMATE

The coast has a moderate climate, the seasons being less marked than in the interior (fig. 6). In January the wind is cutting. The spring is fine, but in April–May it is hazy and the air is damp with strong sea breezes. The heat now increases gradually, especially when the hot wind blows from the interior. June–July are oppressively hot until cooled by the monsoon from the west–southwest during August–September. The rest of the year is fine, cool and clear, with occasional rain.

The interior is the hottest part of Makran, hot enough, according to local tradition, to melt bullets by laying them on the sand.

Here and in Panjgur the year is divided into: spring from March–May (*tabd gwat*); summer from June–October (*amen*); winter (*zimistan*) from November to a short spring (*bahargah*) about February. This is the agricultural year. Fall (October–November) is not recognized, although called *tak rech* = the fall of the leaves. Winter is dry and healthy. During the summer, dense early morning fog (*nod*) is not uncommon, accompanied by heavy dew.

The northern division is cool in summer and cold in winter when the north or northwest wind (*gorich*) is particularly cutting.

The temperature ranges from 113° F. in summer to below freezing point in winter.

Rainfall is scanty and uncertain, with long periods of drought. In the mountains, lightning flashes warn the inhabitants of the plains that floods may be expected; this is usually during July–August or November–March. Rain at the former time is known as *bahargah*, coming from the northwest.

Occasionally, very heavy downpours occur, causing considerable damage to cultivation. In April–May, sudden showers (*tarapi*) take place.

These sudden floods were recorded by Arrian, who wrote in his *Anabasis*, Book VI, chap. XXV:

> . . . for the country of the Gadrosians, like that of the Indians, is supplied with rains by the Etesian [monsoon] winds; but these rains do not fall on the Gadrosian plains, but on the mountains to which the clouds are carried by the winds where they dissolve in rain without passing over the crests of the mountains.

Arrian, writing during the first half of the second century, mentions that one night a torrent, swollen by unperceived rain, rushed down with such violence that it destroyed many of Alexander's army, camp followers and baggage animals, all encamped near its bed.

The southwest monsoon sets in from June 6–July 10. Sea breezes are light from October–January and then increase up to May. Inland, these are known as *chili, chilim* or *zirr shamal.* The nor'wester (*shamal*) of the Persian Gulf blows along the coast for several days. Inland, north and northwest winds (*gorich*) prevail from October–January, and increase in force as the weather becomes colder. They carry clouds of dust and are piercing cold, sometimes causing mortality among the flocks and even among natives. The *gorich* becomes a burning hot wind at the end of March and during April–May, when it is known as *liwar.* This remarkable change in the *gorich* has given rise to a Baluchi proverb, "Double-faced *gorich* is pleasant at neither season: in winter it is bitter; in summer it turns into the burning *liwar.*"

During the spring the southwest wind (*jahl gwat*) helps to ripen the wheat. An east wind (*sar gwat*) sometimes brings rain during the monsoon.

The cyclones of the Arabian Sea do not reach Makran coast, but heavy gales (*airop*) occasionally do damage. In 1899, a windstorm uprooted many date palms and mango trees in Kech. An earthquake occurred in Kolwa and Kech during that same year.

WATER SUPPLY

Since irrigation makes possible the greater part of Makrani agriculture, some details of the water supply are significant.

The artificial open channel (*kaurjo*) cut from a pool (*gwarm*) in a river bed, is next in importance to the *karez.* However, the *kaurjo* is less reliable, because lack of rainfall causes a small flow and continued drought reduces it to a dry ditch. A considerable area is irrigated by *kaurjos* in Kech proper, Sami, Tump, Mand, Pidarak, Panjgur; Buleda is entirely dependent on them.

When I stopped to examine a new *karez* under construction between Turbat and Mand, the 2 Baluchi laborers each came forward asking for money. This was a surprise, for there is no adult begging among the villagers or nomads, except for the blind. Later I found out that this was an ancient custom, called *chug laghati*—"the trampling of the child"—whereby all travelers who stop to see a *karez* under construction or repair give the workers a present.

There are two systems of water-lift:

1) The *dhenkali,* constructed either on *karez* channels to irrigate lands above the normal flow as in Turbat or for wells where the water is close to the surface, as in Mand.

2) The *galgali,* introduced from Sind into Kech, consists of a leather bucket with an elongated tube at the bottom drawn by one or two bullocks over a pulley with a second rope attached to the yoke to open the tube when the bucket reaches the surface. A *galgali,* worked by a pair of bullocks, can irrigate enough land to cultivate 2½ standard maunds of seed, which in a good year will produce 60 maunds.

Dams. There were 5 small dams in Makran: Nilag-e-Bandgah, Gaurag-e-Band, Mandi Kaur Band, Kauhda-e-Band and Ahmad Khan-e-Band. Poorly constructed, these dams are easily damaged by floods. Tradition speaks of former large dams near Oshap, Kulanch and in the Rakhshan.

Division of Water. Permanent sources of water are divided into a number of shares, the principal being the *hangam,* according to the following subunits, the lowest unit being the *pad* in Panjgur and the *tas* in Kech:

Unit	*Equivalent*
4 *pad*	1 *nem tassu*
2 *nem tassu*	1 *tassu*
2 *tassu*	1 *nem hangam*
2 *nem hangam*	1 *hangam*

Each owner of permanent water is allowed 14 *hangams.* Two equal channels (*tagirs*) flow from the *karez,* each carrying 14 *hangams,* thus doubling the share of each owner and enabling him to obtain his share of water in 2 turns at short intervals rather than in one turn after a long interval. Lower down, each *tagir* is divided into as many smaller channels (*giroband*) as there are blocks of lands contiguous to each other. For the distribution by individuals, a stone water-stop (*garrok*) is assigned to each channel.

A water-controller (*kahn-e-sarishta* in Kech, *kahn-e-kauhda* in Panjgur) is appointed to distribute the supply. As remuneration, the *sarishta* first takes the whole supply from the *karez* for 24 hours to irrigate his own lands. Choice of sequence is decided by casting lots.

By day the division is made by dialing in a carefully leveled space. The pointer (*mohr*) is a straight stone 19 inches high. In Baluchi *mohr jata,* literally "the sun has struck the pointer," is midday; *mohr gwasta* means post-meridian. Arrian (*Anabasis,* chap. XXV) refers to the absence of shadow at noon in Gedrosia. This might well allude to the use of the *mohr.*

The day is divided into many *tassus,* the first of which is completed when the shadow of a man standing over the *mohr* reaches a point 25 paces from the center. A pace is here measured by placing both feet in line. The second *tassu* is completed at the twelfth pace, the third at the seventh, the fourth or 1 *hangam* at the fourth pace, the fifth at the second and the sixth when there is no shadow. The process is graphically illustrated in figure 8. Thus, in a day during which the sun is visible for exactly 12 hours, 1 *tassu* = 1 hour.

During overcast days or at night, the water clock (*tas-o-ab*) is used. This is a metal bowl 3 inches in diameter and 2 inches deep. A tiny hole is drilled in the center of the bowl which is floated in a basin of water.

The time which it takes to sink is 1 *pad;* 3 dips of the *pad* make 1 *nem tassu;* and 24 make 1 *hangam.* The day or night, however, is divided into 3½ *hangams* and in order to adjust the difference of half a *hangam,* or 12 dips, a bowl with a slightly larger hole is used; in this case 28 dips = 1 *hangam.* Thus the 24 *pads,* which, theoretically, there are in 1 *hangam,* are actually divided into 28 portions or 7 dips for each *tassu.*

The owners take it by turn to work the water clock by day and by night. For this supervision each man receives 2 extra dips (*pazh bandi*) for each *hangam.* The difference in the length of a *tassu,* due to the varying hours of light or darkness, is compensated by each owner receiving his share by day or by night alternately. This system actually prevails only during the summer because of the lesser amount required in winter.

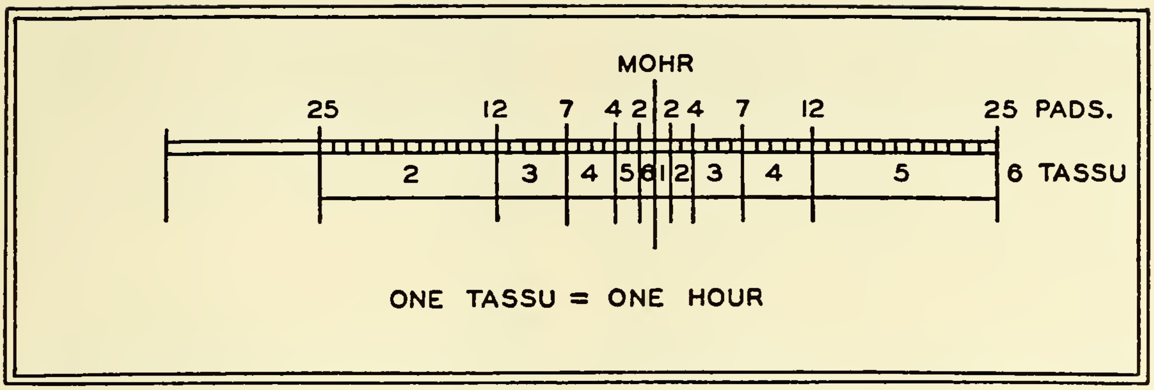

Fig. 8. Baluchi time divisions for water control.

In Turbat on the Jusak *karez,* the day is counted from the first notes of the nightingale, known as *bulbul-e-bang,* to the time the cock goes to roost, called *murghai drang.* This system is popular because it enables the 2 extra *tassus,* 14 in all, to be fitted in, one before sunrise, the other after sunset.

Flora

Forests. The more extensive areas are mostly covered with *kahur, chigird, kabbar* and tamarisk. The most important forested areas (fig. 7) are:

1) Sarinkin Tad, a narrow strip of jungle between Tump and Kalatuk.
2) Sar Dasht in Kulanch.
3) Marrah in Kolwa.
4) Kahn-ai-Kahurdan in Parom.
5) Shahbanz jungle in Dasht-e-Shahbanz.
6) Gichk jungle in Gichk Valley.

The largest trees are *chish* or *babul* (*Acacia* sp.) in Kulanch and the *kahur* (*Prosopis spicigera*) around Jiwnri. The *kunar* (*Zizyphus jujuba*) is fairly abundant. The *kaler* (*Capparis aphylla*), *shirish* (*Melia azadirachta*), and *karag* (*Ficus benghalensis*) are not so common. In addition, flourish the *bed* (*Salix acmophylla*), date palm (*Phoenix dactylifera*), *gazz* (*Tamarix gallica*), *gwan* (*Pistacia cabulica*), *hat* (*Olea cuspidata*), *jak* (*Dalbergia sissoo*), *kasur* (*Pistacia mutica*) and *patk* (*Populus euphratica*).

Among forest products may be listed the dwarf palm (*pish*), asafoetida (*Ferula narthex* Boiss.), gum from the *kahur, chish* and *chigird* trees, and the medicinal drugs called *gurdir* and *izgind.*

The most important is *pish* (*Nannorhops ritchieana*), a stemless, gregarious shrub common on rocky ground up to 3,000 feet. The leaves are woven into mats, fans, baskets, caps, sandals and other articles for local use. Ropes are made from the leaves and leafstalks. The delicate young leaves are used for diarrhea and dysentery. The heart is eaten uncooked as a vegetable in times of scarcity. The seeds, strung as rosaries, are exported via Gwadar to the Arabian Peninsula. The stems, leaves and petioles serve as fuel. As tinder for matchlocks, the brown, mosslike wool on the petioles, called *purz,* is used, after being dipped into saltpeter. A drinking cup is made of the entire leaf by tying together the tops of the segments.

Bushes. Among the more important are *chigird, eshark, gwanik* (*Vitex trifolia*), *jugr, kark* (*Calotropis gigantea*), *pir* or *kabbar* (*Salvadora oleoides*) and *zirruk.*

Grasses. Barshonk, Dil (*Andropogon*) *Drug* or *Drab* (*Eragrostis cynosuroides*), *Gandil* or *Granachin* (*Eleusine flagellifera*), *Gomaz* (*Allium sphaerocephalum*), *Gorkah* (*Ischaemum angustifolium*), *Indarkah* (*Trianthema pentandra*), *Kandar* or *Baun, Kash* (*Saccharum spontaneum*), *Magher* (*Rumex vesicarius*), *Makankur, Nadag, Putar, Putronk, Shimsh, Sibr,* and *Sundum* (*Epilasia ammaphila*).

Plants. Doliko, Hanshag, Kal, Kalmurag, Kohalo, Kunchito, Landin, Lanto, Mesk, Pish (*Nannorhops ritchieana*), *Rigit* (*Suaeda monoica*), *Sorichk, Shurdo* and *Traht.*

AGRICULTURE

There exist many traces of former irrigation. We saw many low-walled enclosures, now far from water. These are called locally *gabrbands* or variants. An account is given by Cook (1859), who wrote:

> I have mentioned repeatedly in this journal the presence of Ghorbastas, or Ghorbands, on the line of march—structures at times almost bearing a resemblance to the Cyclopean remains of Europe. They are evidently traces of a people who occupied or passed through the country long prior to the advent of the present Baluchistan occupants, who know nothing of the builders or of the uses of the building, but, as before stated, attribute them to Kaffirs or Infidels. They are found usually in out-of-the-way places, narrow valleys at present stony and barren, and present the following characteristics. They are placed always on declivities, or across the mouths of ravines. Their solidity and size are proportioned to the steepness of the declivity; thus, where there is only a gentle slope, the walls are narrow and low and slightly built, but where the descent is great and the flow of water after floods and rains would be violent, they are of great thickness and height, and, as seen in the valley beyond Baghwana, supported and strengthened by buttresses or walls built at right angles. They always present a scarped face to the descent, and the opposite side, when well preserved, is levelled off with the surrounding and superior ground. Those built across the mouths of ravines are very solid and high, and usually the builders have taken advantage of some mass of rock jutting out as a sort of foundation. Those on slopes are never seen singly, but always in numbers varying with the extent of the ground to be covered, and placed in succession one behind the other. The intervening ground, being levelled, is thus formed into a succession of terraces. These facts can lead, I think, only to one conclusion, namely, that they were connected with the irrigation of the country. Those built across ravines were intended to form tanks for the preservation of the water that came down at irregular intervals in floods.
>
> Those on slopes, to economise the distribution of the water, the surplus water of one terrace running over and flooding the lower one, depositing as it went a layer of surface soil. The ground thus levelled of course became more valuable, freed from the irregularity and roughness which characterise these narrow stone valleys.
>
> It has been argued that they were intended for defence, and that like structures exist in the northwest which have been used unmistakably for that purpose; but a series of low, level terraces, in many cases not raised more than 2 or 3 feet above each other, were surely not adapted for defence, and uses of the higher and stronger ones appear to me so evident that after examining some hundreds of them I cannot subscribe to this opinion. They are almost confined to the province of Jalawan, and are largest and most important in the southern and south-eastern portions of the province. I have mentioned the ancient city of Gwarjak; that it is of the same date, and constructed by the same people, I think extremely probable.
>
> From the numbers and position of these structures the people who built them must have been extremely numerous, must have felt that the country as existing by nature was utterly incapable of supporting them, and they must have been possessed of an energy and ingenuity which the present races are totally without. It appears probable, nay almost certain, that they must have swarmed eastward over the mountains from Makran, making their appearance on the southwest portion of the table-land. Gradually pushing eastward and northward, as their numbers increased, either rapidly by additions from without or more slowly by increase of the population from within, they ascended to the various valleys as high as Kalat, when, discovering the great eastern outlet, the Mulla Pass, they found an exit by it into the plains of India. How long they remained on the table-land, from whence they originally came, and over what countries they eventually distributed, are alike mysteries.

From an historical point of view, we can turn to Idrisi (*ca.* A.D. 1154) who mentions that sugar was grown in Makran.

For centuries cultivators, rather than cultivable lands, have been scarce. The scanty rainfall could be supplemented by irrigation through repairing old, maintaining present and building new underground channels (*karezes*) and open-water channels (*kaurjos*) from pools in river beds and by digging wells and by constructing catchment basins.

Soils. The soil of the *khushkaba* tracts is very rich, but the irrigated areas have been denuded of nutrients by continuous cropping or date plantations. The date is the staple food of the Baluchis; they care little for grain. Dry crops grow in clayey *milk* and silty *mat* soils. In irrigated areas the soils are called *rek* and *zawar*, *dal* or *dals* and *sorag*.

Milk is a soft, white clay deposited by streams and hill torrents; this is the richest in Makran, especially for wheat and barley. After plowing, a field is so soft and friable that a man sinks into it, for it is very retentive of water. There is another kind of *milk* called *gach,* a bluish-white deposit, which becomes hard and uncultivable after 2 or 3 years of cropping. Then it must lie fallow for the same period. One of the peculiarities of *gach* is its hardening after flooding; large crevices enable the sun's rays to suck up the moisture. To prevent moisture losses, close sowing of cereals is practised. This soil is well adapted to cotton cultivation.

Mat consists of a thick layer of silt containing a mixture of earth and sand. Although liable to cracking, *mat* is believed to be superior to the *milk* of dry crop areas. Lands which receive these deposits of *mat* once or twice a year are called *bug;* the principal areas are in Dasht and near Isai in Panjgur. In the former *juari* (loc. *sohro*) is grown; in the latter, wheat flourishes.

Rek, so-called in Kech but *zawar* in Panjgur, is composed of *milk* mixed with sand. Most of the irrigated lands contain this soil. *Rek* is considered only inferior to *milk* as it takes moisture easily and the subsoil retains it. Rice flourishes in *rek,* but wheat is unsuitable. *Zurrat,* the *juari* grown in irrigated areas, grows well in *rek.*

Dal or *dals* is a stony soil composed of rubble and *milk* overlying a hard, rocky substratum. This is found in fields excavated in hillsides and along river beds. A good deal of the land near Tump is *dal.* Wheat, beans (*banklenk*) and such vegetables as sweet potato (*pindal*) and onions, fruit and date palms flourish in this soil.

Kork, so-called in Panjgur, but *rod* (= copper) in Kech, is a rocklike soil which turns hard when exposed to running water. Cultivation is not practicable, unless *milk* is added after it has been dug waist deep. It soon deteriorates as it is impossible to add sufficient *milk,* and consequently requires much manure. Irrigation from river pools by open-water channels (*kaurjos*) gives *kork* lands added silt. Many Panjgur gardens are laid out in such lands and *zurrat* is cultivated under the date palms.

Sorag is the soil saturated with saline matter. Where no other land is available in irrigated tracts, *sorag* soil is rendered cultivable by manuring with cowdung. Surface saline efflorescence is removed; water is allowed to stand until the manure is absorbed. Date trees, wheat and rice grow in *sorag,* but *zurrat* never flourishes here.

Dak consists of vast, flat stretches of hard, white bare clay. These appear to be flat, but slope imperceptibly toward a particular area where surface water drains. This impermeable stratum leads the run-off into embanked fields.

Pat resembles *dak* except that it is softer and is covered with rank growth and pasture.

Kallar is more impregnated with salt than *sorag.* The largest tracts are near the coast as at Kalmat between Jiwnri and Gabd.

Kap is also more saline than *sorag.* Salt is produced in the basins of Kolwa, Balgattar and Parom and at Pasni.

Makran consists of a series of valleys (*kuchas*), which are referred to by Baluchis in a more restricted sense as those tracts with *khushkaba* areas. Following rain in the mountains, the surface water rushes into torrent beds (*sheps*), which debouch into narrow channels (*chil* or *dor*).

The beginning of summer rains (*bashsham*) is heralded to the Baluchi cultivator by the rising of the Pleiades (*paur*) in the early morning. Rain is expected within 5 days. Otherwise, he must wait 25 days for Cassiopeia (*tirband*) in the east a little below the Pleiades.

The cultivators are the most numerous class; a few possess lands of their own. The principal groups so engaged include the Darzadas of the Kech Valley, who are generally cultivators in irrigated lands; Dashtis, Lattis, Bizanjaus, Rinds and Hots and others in Dasht; Bands, Jadgals, Puzhes, Wadelas and Sangurs in Kulanch; Kolwais, Bizanjaus, Sangurs, Mirwaris and Rakhshanis in Kolwa; and the Nakibs, Barrs, Kashanis, Shambezais and Singozais of the Panjgur Valley. With the exception of the Nakibs and Darzadas, the rest combine flockowning and transport with cultivation as they generally hold only dry-crop areas, the supply of water for which is exceedingly precarious.

Four periods for sowing and reaping are recognized:

1) Spring sowing (*tuhm kishan*) in October–November is determined by the rising of Ursa Major (Takht-e-Sulaiman = "Throne of Solomon").

2) The reaping of the spring crop (*jopag*)

takes place between Zilhij and Muharram (March 15–April 15).

3) The Kharif crop, called *karrai* sowings, is planted during the month following the end of February. The principal autumn crop of *sohro* (*Andropogon sorghum*) is sown during February–July.

4) The harvest is gathered 90–100 days after sowing, the latest being at the end of October.

Table 6. Chief Crops in Makran

Season	*Irrigated Land*	*Unirrigated Land*
Spring	Wheat	Wheat
	Barley	Barley
	Beans	*Panicum miliaceum* (*arzun*)
	Lucerne	
	Lens esculenta (*niginz*)	
	Tobacco	
Autumn	Rice	Sohro (mixed crop)
	Sorghum (*zurrat*)	*Andropogon sorghum*
	Cotton	*Phaseolus mungo* (*mash*)
	Garden produce	*Phaseolus aconitifolius* (*parmash*)
	Vegetables	
		Zea mays (*mak*)
		Melons
		Watermelons
		Cotton

In table 6 the native names are given in parentheses following the Latin names.

The cultivator of irrigated lands is always busy for he waters, manures and fences his fields and repairs constantly his sources of irrigation.

The busy season for the cultivator of unirrigated lands lasts from February–September. After plowing in February, the wheat and barley are harvested in April. Then the mixed crops of *juari* or *juwari* (loc. *sohro* or *zurrat*), cotton, *mash* (*Phaseolus mungo*), *parmash* (*Phaseolus aconitifolius*), *mak* (*Zea mays*), melons (*Cucumis melo*) and watermelons (*Citrullus vulgaris*) are ready for garnering; this continues until October, but cotton-picking may continue for 30 days later.

The date is by far the most important crop. Wheat, barley and rice come next in order. Barley is grown in small quantities, except at Kolwa, where it is the only spring crop. Rice flourishes in Kech, Tump, Pidarak, Buleda and Panjgur. Sesamum (*kunchit*) is grown in very small quantities; no oil is extracted.

The mixed crop includes peas (*banklenk*), *pindal* (*Ipomaea batatas*) and *niginz* (*Lens esculenta*). Few vegetables are grown: pumpkins and *brinjals* in Kech; turnips in Panjgur.

Agricultural Implements. Repairs to embankments (*ispands*) of enclosed fields (*bands*) are made with a broad, plank harrow or scraper shod with iron, called *arin* or *ken*, 3½ feet long and 2 feet wide. The plow (*shomag* or *langar kanag*) breaks up the clods. The surface is leveled by a log roller (*marz* or *malag*), which is 6 feet long, 1 foot wide and 6 inches thick.

Sowing (*palli*) is done with the drill (*kapatag*) woven from dwarf palm instead of wood. Broadcast sowing (*sar chand* or *shank dayag*) is usual for spring crops. When being harvested (*ron*), the ears with beards (*pug-shan*) are cut 3 inches above ground. The ears are then taken to the threshing floor (*johan-ja* or *johan-dan*), where they are turned several times daily either with the 2-pronged fork (*do-shaha* or *jamks*) or the 5-tined fork (*panchan*) for 4 days.

Threshing is done by: (*a*) trampling (*ram*); (*b*) dragging a heavy beam over the ears (*kunt*); or (*c*) with the flail. For wheat and barley (*b*) is used; for millets, *mash*, etc. (*c*) is employed.

A wooden spade (*kasag* or *hanshon*) is used for winnowing (*er-dayag*); this is always done during the afternoon because of the breeze (*jahli gwat*), which springs up and continues until sunset. The chaff (*pug*) is separated from the grain (*dan*), which is stored in large bags (*pat*) woven from dwarf palm. In Zamuran and the *kushkabas* of Panjgur, the grain is stored in a pit (*kurm*).

Little attention is paid to weeding (*lad-o-buch*). On irrigated lands the *zurrat*, a variety of *sohro* (*Andropogon sorghum*), is sometimes weeded when in ear. Tobacco fields are cleared when the plant is flowering. On unirrigated areas, before plowing, the weeds are gathered and burned when dry.

Among minor tools are: (*a*) an iron-pronged fork (*kalmagor* or *koraz*) for making small embankments; (*b*) the spud (*rambi*) for weeding; (*c*) the mattock (*kodal*); (*d*) the shovel (*bard*); (*e*) the sickle (*das*); (*f*) an iron bar with a sharp point for transplanting called *mubang* or *metin;* and (*g*) a wooden spade also used in winnowing called *dali.*

Fruits. The date is seen almost everywhere, especially in Kech and Panjgur. Mangoes are the most numerous trees in Kech. There are also: guavas, lemons, sweet and sour limes, plantains (*moz*), sebestans (*Cordia myxa*), known locally as *liwar, kunar* (*Zizyphus jujuba*), tamarinds (*Tamarindus indica* Linn.) called locally *chichak*, and a few figs. Zamuran produces apples; grapes and pomegranates grow well in Panjgur. Sweet melons and watermelons are grown, but are of poor quality.

Vegetables. These are rare, for the Makrani looks upon vegetables with contempt, terming them indiscriminately "grass" (*kah*). However, radishes and carrots are grown in Kech and Panjgur. Turnips are cultivated in Panjgur, where they are considered a luxury to be eaten with dates. Pumpkins (*khosich*) and a few *brinjals* grow in Kech. Spinach is cultivated in Turbat. Onions may be obtained in many places. The only vegetable commonly cultivated in Kech is the sweet potato (*Ipomoea batatas*) called *pindal.*

Dates. Dates (*na* in Kech, *hurmag* in Panjgur) form the principal crop of Makran (*see* Appendix N). *Amen*, the date season from July–September, is the focal point of the Makrani way of life. Baluchi mountain-dwellers, nomads and fisherfolk migrate into the date districts. The women of all the countryside, together with as many men as can accompany them, collect in the date-producing tracts for these 4 months. Here they pick dates and live on them. Horses, camels, cows, donkey and dogs—everybody and everything lives on the date. We saw dogs in Panjgur eating date seeds.

In Makran, tradition asserts that *Phoenix dactylifera* was introduced by early Arab invaders. Arrian (first half of second century) and Strabo (*ca.* 63 B.C. – after A.D. 21) mention the palm trees and dates of Gedrosia when Alexander marched through Makran in 326 B.C.

Xenophon (*ca.* 430–355 B.C.) in his *Anabasis* writes that the principal food of the Ichthyophagoi (= fisheaters) was dates, in addition to fish. He adds that the remnant of Alexander's army was saved from destruction by obtaining a large supply of dates.

It appears probable that date cuttings from Oman, the Persian Gulf and the Shatt-al-Arab in Lower Iraq (formerly Mesopotamia) have been introduced from time to time into Makran. The sea-borne traffic between Gwadar and such ports as Muscat in Oman, Manama and Muharraq in Bahrain Island and Basra in Iraq has continued for several millennia. The Makrani names for such species of dates are of Arabic origin: *jowana bu shams, masudi, musoli, rabai, barni* and *halevi.*

Date trees (*mach*) range widely throughout Makran; Panjgur and Kech are the principal localities. The Makranis have more than 100 different names, the general distinction being in color, size, shape and taste of the fruit (*see* Appendix N).

All date trees are divided into 2 classes by the Makranis: (*a*) *nasabi*, pedigree trees whose names have been handed down from generation to generation with such names as *ap-e-dandan, begam jangi, halevi, nazani* or *nazan-e-tabaqi, zard-e-kallagi, muzati* or *muzawati* and *sabzo;* and (*b*) *kuroch*, indigenous self-sown trees.

Date tree cultivation is a very specialized art. When young (*warna*), the date palm grows rapidly from a selected offset (*gwang* or *nihal*) attaining a height of 6 feet in the same number of years. It is said that a tree will retain its youth for about 180 years. A well-nourished date palm attains a height of 80–100 feet and a girth of about 5 feet.

There are 4 seasons in date cultivation: (*a*) *Machosp* for fertilization of the date-spathes; (*b*) *Pappukwar* denotes the eating of the raw fruit; (*c*) *Rang* or *kulont*, the appearance of the color of the date ending with the new fruit (*nokna*); and (*d*) *Amen* when the mature fruit is picked by a climber (*tor* in Kech, *parbun* in Panjgur), who wears a flat, broad strap woven from palm leaves as an ascending aid (*chakata*).

The average produce of ripe fruit from a tree has been estimated at 1½–3 maunds, although in rare cases double that yield is recorded. Gichki and Nausherwani chiefs once wagered on whether a full-grown Kharan camel could lift the *kulont* produce of a *muzati* tree in Panjgur. The camel failed.

Trade in dates is carried on chiefly by barter. We passed several camel caravans loaded with grain and tobacco heading for Panjgur. Their reply was always, "We go to exchange our load for dates."

Every part of the date palm is utilized in construction or in making household goods, such as baskets and mats. The terminal heart (*kush*) is considered a great delicacy. A concoction made by boiling dates is given to a baby immediately after birth. Dates mixed with ashes and ghee are used as a fomentation. A solution of date, *kark* (*Calotropis gigantea*) and salt is used for tanning. Animals of all kinds are fattened by giving them a gruel (*nok*) made of compressed dates kneaded in water, morning and evening, during the *amen* season. The result, whether cow, horse, camel or sheep, is quickly apparent. Care should be taken not to work the animal hard or to allow it in the sun, as it is liable to die from "fat rupture" (*pigsind*).

FAUNA

1) Wild animals include antelopes, leopards, wolves, jackals and foxes, hares, porcupines and hedgehogs, with occasional bears, hyenas and badgers. On the hills of Makran and in the north and northeast of Kalat, ibex, markhor and wild sheep are common. Wild pig are reported in the neighborhood of Panjgur, and are numerous at Oshap in the Kech Valley, in Buleda, and at Awaran in Kolwa. Ravine deer are common throughout the country, especially near the coast. Rats damage cultivated areas.

Of game birds, the gray partridge and sisi are scarce and are found only in the Zamuran Range; a few black partridges haunt the jungles on the river banks and wild duck frequent the pools of the river beds in winter. Sand grouse live in sandy areas always accessible to water.

Snakes are encountered throughout the country; they are less numerous in the north, but increase in the center and south. Of the deadly species, the most common is a small one locally called *garr* and a black one known as *siahmar*. We saw very few snakes between Pasni and Quetta. The villagers told us they were rare, except at certain seasons. The majority were believed locally to be poisonous. For a list of our collection *see* Appendix E.

2) Domestic animals include camels, horses, donkeys, bullocks and a few buffaloes. Large numbers of sheep and goats are raised. There are many chickens in each village.

Camels. Dasht is famous for its camels, the largest owners being the Dashti, Latti, Birdi, Lagori and Langasi. The full-grown camel (*lerau*) of Kolwa is well known for its size and strength. The largest breeders and owners are the Bizanjau, Sangur, Kolwai, Korak, Rakhshani and Koh-Baluch. In Panjgur the Barr Kashani, Shambezai, Singozai, Dehani and Gurgnari are the principal breeders and transport owners. Panjgur camels are bought and taken to Sarawan by the Brahuis, since they alone, of all Makrani camels, are hardy enough to stand the intense cold in the highlands. Riding camels are fed a special ration of grain (*kadim*) in addition to their regular fodder.

Horses. Large areas of the interior and the coastal strip are unsuitable for horses. In general, the horses are inferior to those of Kandahar and Herat in Afghanistan. However, those bred by the predatory tribes in the Mari and Bugti hills and to their north are renowned for endurance, if not speed. The excellence of the "Baluch mare" is proverbial, although the Makranis do not like to ride them. The Kalmatis had a local reputation for good stock. In the western districts, a hardy type of pony is raised. South of Kalat a strong breed is reported.

Donkeys. The breed of donkeys is remarkable for its fleetness rather than its size. The best come from Persian (Iranian) Makran, a breed called *barri,* imported from the Gulf of Oman littoral. Merchandise is carried on donkeys to Pasni from Turbat and Zamuran and other places. Donkeys are bred by the Nakibs, Darzadas and Loris, who keep stallions.

Cattle. The Makrani bullock is small and generally brown in color. The cultivators breed sufficient numbers for plowing. Kulanch and Nigwar are the only places where a few are bred for sale. Those from Nigwar are especially good in the plow. The bullock is not used as a beast of burden, a custom believed to be a curious survival of former Hindu feeling in a Moslem country.

Buffaloes. They are found in Kech, at Oshap and at Awaran in Kolwa. A few are owned by the Sangurs along the coast.

Sheep. These are fat-tailed (*ispet-nas*) of different colors; white is most common, then black, brown (*bor*) and gray (*kirg*) in equal numbers. The brown and gray wool is not sold by the Baluchis, but is used for overcoats (*shals*). A 4-horned sheep, generally white, is peculiar to Dasht and Nigwar. Sheep are shorn twice annually. Each animal produces about 1 seer of hair.

Goats. The indigenous goat (*siah-pas*) is black with long hair. The Malabari, imported from Malabar by the Meds, is seen chiefly along the coast, occasionally in the interior. The latter is kept in the village and valued for its large supply of milk. Goats are shorn once annually.

The Baluchi flockowner divides the year into 4 seasons: (*a*) *Baragah* from February–April; (*b*) *Bashsham* from May–September; (*c*) *Chen*, the shearing time from October–the middle of November; and (*d*) *Zimistan* from November–May.

At the end of February, the shepherds emerge from glens around Panjgur or from villages in Kech to pasture their flocks in the fresh grazing. They shear the sheep, goats and camels early in March. Lambing commences at the end of March or early in April. They now make condensed whey (*shilanch*), fresh cream cheese (*paner*) and butter from which ghee is manufactured. The flocks go dry in September.

At the beginning of *Bashsham*, the shepherd migrates toward the permanent settlements (*shahristan*) to await the date harvest, pasturing his flocks on neighboring hillsides. By the time of the second shearing, he is in his winter quarters ready to take shelter from the northwest wind (*gorich*).

Fodder. Except in the Dasht, around Pasni, Turbat and Panjgur, there is abundant grazing. The valleys of Kolwa, Buleda, Parom and Rakhshan are among the richest grazing tracts. In Kolwa there are 2 excellent pastures, in Murrah and in Lengari Drug. The grass in both these localities is known as *drug* (*Eragrostis cynosuroides*), and sometimes grows to a height of 4–5 feet. There is no cattle-feeding problem, since wheat and millet straw and some lucerne are available. *Kash* (*Saccharum spontaneum*), *dil* (*Cyperus esculentus*), *barshonk* and many other grasses afford good fodder for bullocks, cows and buffaloes. Sheep and goats eat *kandar* or *baun*, *gorkah* (*Ischaemum angustifolium*), *putronk*, *dil*, *kash*, *putar*, *gomaz* (*Allium sphaerocephalum*), *sundum*, *magher* (*Rumex vesicarius*) and *makankur.* Goats and camels browse on *kunar* (*Zizyphus jujuba*), *kabbar* (*Salvadora oleoides*), *kahur* (*Prosopis spicigera*) and *chigird.*

Poultry. Numerous scrawny chickens exist in every community.

Dogs. There is a good breed of greyhounds indigenous to the country. These are valued greatly by the sport-loving landowners. Every hamlet has several brindled mongrels to announce the arrival of a stranger.

HISTORY

The geographical position of Makran, linking Iran, the Persian Gulf and the Arabian Peninsula with the Indus Valley and the Indian subcontinent, has placed this inhospitable land on the main line of communication between East and West.

Baluchistan, or "the land of the Baluchis," has been occupied at least since Mesolithic times. The early historical record remains obscure, although we found additional evidence linking the ancient civilizations of the Iranian Plateau and Mesopotamia to the west with those of the Indus Valley to the east. Denys Bray (1913a, p. 12) summarizes our knowledge as follows:

> Of ancient Baluchistan strangely little is known, yet it lies on one of the great highways trodden by the many conquerors of India. Achaemenian, Macedonian, Arab, Ghaznavid, Moghul, Afsharid, Durrani have sojourned in it and after a brief sojourn passed on, leaving scarce a trace behind. And though the mists that brood over ancient Baluchistan are broken by the Persian poet and Greek and Arab historians, nothing stands out clear from the written records except a vivid picture of Alexander's amazing march through the wastes of Makran. Of the ancient inhabitants of the country they tell us tantalisingly little. . . .

The oldest written reference to any part of Baluchistan is given in the Zend Avesta (Pah. *zend* = commentary and *avesta* = law), the scriptures of Zoroastrianism, where the Vara Pishinanha [Valley of Pishin] is mentioned.

Herodotus writes that the Mykians—the Maka of the Behistun inscriptions in Iran—were listed by Darius during the sixth century B.C. Makran is probably "the land of the

Maka." Strabo and Arrian also mention Makran in their records.

Arrian divided the population into the coastal Ichthyophagoi (= "the fisheaters") and the dwellers in the interior, the Oreitai and Gadrosoi (Gedrosoi) of Gadrosia (Gedrosia).

Arrian (*Anabasis*, Book VI) writes:

> These people are called Ichthyophagoi, because they live on fish. The tenderest of them they would eat raw as soon as they draw them out of the water. But they dry the larger and harder ones in the sun, and when they are thoroughly baked, they grind them down and make meal of them and loaves. Others bake cakes from this meal. Their cattle also live on dried fish, for the country is destitute of meadows and does not produce grass . . . the most prosperous of them collect the bones cast up by the sea and use these instead of timber for their houses; the broad bones which they find, they make into doors.

It has been suggested that the Oreitai are now represented by the Hots, the Gedrosoi by the Gador, a few of whom live in Las Bela and form part of the present Jadgals or Jats.

Following the death of Alexander at Babylon in 323 B.C., two of his generals, Antigonus I or Cyclops (382?–301 B.C.), and Seleucus I or Nicator (died 280 B.C.), emerged as competitors for supreme power in Asia.

In 312 B.C. Seleucus I recovered possession of Babylon and within 6 years had become ruler of Central and Western Asia, extending eastward to the borders of India. It is presumed that he marched eastward across Makran to cross the Indus River in 305 B.C. where he was defeated by Chandragupta, the Rajah of Magadha. Seleucus I was forced to conclude a humiliating peace, by which he ceded Makran and several other provinces to the Rajah in 303 B.C.

Baluchistan became part of the Bactrian Kingdom, which was overthrown about 130 B.C. by the Sakas (Sacae) from Central Asia. About this time Buddhism flourished in this country.

There is now a gap in our knowledge of Makran until during the fifth century Shermah, Malik of Hind, gave his daughter in marriage to Bahram Gur (A.D. 404–27), the fourteenth sovereign of the Sasanian Dynasty. As part of her dowry, she received "the country of Sind and the territory of Makran." Bahram Gur returned to India with several thousand dancers, probably the ancestors of the gypsies.

Nausherwan (A.D. 529–577), the Sasanian ruler, may be described as the first conqueror of Baluchistan. Then came the Turanians under Afrasiab who were again driven out after 5 pitched battles by Khosru I (531–70), greatest of the Sasanian monarchs. Khosru I (Chosroes) is said to have spent a year in Makran, improving agriculture, importing expert cultivators to lay out fruit gardens, and attending to the grazing for his horses and hunting grounds. When Khosru I left, he appointed Ashkash as Governor of Makran. It is probable that the 2 *karezes* in Turbat, known as Kausi and Khusrawi, were named by him after his royal patron.

Presumably, Makran remained in Sasanian hands for the next 2 centuries for Khosru II (591–628), known as Chosroes II or Khosru Parviz, is mentioned as having recovered the eastern provinces of his father's kingdom toward the Indus, which had revolted. In Sind the Brahman Dynasty arose about this time and Rai Chach marched in 635–36 to Kirman to determine the boundary of his dominions. According to the *Shah Nama* of Firdausi (A.D. 1010), Chach selected an auspicious time, fixed by astrologers, to march on Armabel (Las Bela) and thence across Makran.

Chach halted to plant date trees along a stream and set up a marker inscribed, "This was the boundary of the Hind in the time of Chach bin Silaij bin Basabas. Now that boundary has come into our possession."

Makran was thus under the rule of Sind when the Arab invasions began.

Shortly after the death of Mohammed in A.D. 632, Ashari, the Governor of Basra in Mesopotamia (Iraq), wrote the Caliph, Abu Musa, that "the King of Hind and Sind was powerful and contumacious, following the path of unrighteousness," and that "sin dwelt in his heart."

Later, after the conquest of Persia, the Arab generals, lured by the wealth of India, drove east. Abdullah bin Abdullah led an invasion against Makran in the last year of Umar's Caliphate (634–43). Malik Saad, with Sindi reinforcements, offered stubborn resistance, but was finally defeated. Saadabad *karez*, near Kalatuk, supposedly was built by an Arab ruler.

Abdullah reported his victory over Makran to the Caliph in the following graphic account:

> Commander of the faithful, it is a country of which the mountains are mountains indeed, and the plains of which are real mountains; it is a country with so little water that its dates are the worst of dates, and the inhabitants are the most warlike of men. If thou hadst a less numerous army there, it would be annihilated and could do nothing; and if thy army is considerable, it will perish of hunger, because there are no victuals. The country beyond is still worse.

Umar then seems to have issued instructions not to attempt the conquest of Sind. Makran became the base for the officer commanding the Indian frontier.

However, while Taghar bin Dair was fighting near Kaikanan (probably Nal), quarrels at home culminated in the assassination of Ali at Al Kufa (Iraq), in the year 661 and the succession of Muawiya (661–80), the first Omayyad, to the Caliphate. Shortly thereafter, Abdullah bin Suar was completely defeated near Kaikanan, only a remnant of his army returning to Makran.

Sinan bin Salama succeeded Abdullah, took up residence and founded cities in Makran. He was followed by Rashid, who made a successful inroad on Kaikanan, but was killed by the Meds. Sinan bin Salama, who was reinstated, marched eastward but was slain treacherously in Kachhi.

Trouble at home prevented attention to the eastern outposts until Abdul Malik (684–704) appointed Hajjaj Governor of Iraq. Hajjaj put Said bin Aslam in charge of Makran; he was killed by the Allafis, who captured this province but subsequently retired to Sind. Said bin Aslam was succeeded by Mujaa, who died after only one year of tenure in 705.

Upon the succession of Walid (705–15), Muhammad bin Harun surnamed Makrani, was appointed to Makran and the Indian frontier. He sent reinforcements to Budail, who had been ordered to advance toward the Indus Delta. This led to disaster and Budail was killed.

Hajjaj then nominated Muhammad bin Kasim, a youth, to the supreme command of the Indian frontier. In 707 he captured several strongholds in Makran and advanced to the Indus. After his conquest of Sind, Makran was amalgamated into the new enlarged province.

The Arabs ruled Baluchistan from Khuzdar in Jhalawan until the second half of the tenth century.

Another historical hiatus follows until Ibn Haukal writes that an Arab named Isa bin Madan had established residence in the city of Kiz (Kech).

Frequent references to Makran are made by other Arab geographers of this period (*ca.* 1150). Among these are Ibn Khurdadba, Al Istakhri and Al Idrisi, who agree that Makran "is for the most part desert."

During the next 7 centuries, Makran came under the temporary sway of many foreign dynasties. However, it was not until the time of Nasir Khan I (1751–94) that half the revenue of Makran was assigned permanently to the rising power of Kalat.

Local tradition assigns the following order to the local rulers: Hots, Rinds, Maliks, Buledais and Gichkis.

Malik Tajuddin is mentioned as ruling Makran in the time of Ghiasuddin (1157–1202), the first Ghorid prince; thus, the Hots and Rinds were in power during the eleventh–twelfth centuries.

Temporary foreign rulers included the Deilamis, Ghaznivids, Seljuks, and Ghorids.

Then came the conquest from Kirman in behalf of the Khwarazym (Khorezm) rulers of Khiva. It was at this time that the Mongol hordes swept across Asia and in 1223 Chagatai, son of Genghis Khan, was dispatched to lay Makran waste and cut off the retreat of the ruler of Khiva, Sultan Jalaluddin. Two cliffs, one in the Gokhprush Hills and the other north of Sami, known as Mughal-e-Galt (= "the Mughal's precipice"), mark this event.

Sultan Altamash of Delhi ruled southern Baluchistan, but it soon reverted to the Mongols.

The rulers of Kirman seem to have been in loose control of Makran until Amir Adugui, on whom Tamerlane (Timur-i-Lang) had conferred Kirman, penetrated as far as Kech at the beginning of the fifteenth century.

The Portuguese captured several places along the Makran coast on their way to India. Pasni and Gwadar were burned in 1581.

Then followed a period of local rulers, called Maliks, beginning with Malik Tajuddin, who was in power at the end of the twelfth century and ended with Malik Mirza, who was killed by the Buledais about 1615.

When Marco Polo referred to Kesmacoran (Kech Makran) as being "a kingdom with a king of its own and a peculiar language," it is presumed he referred to this Malik Dynasty.

The Bu-Said, who founded the Buledais, are believed to have come either from Garmsel in the Helmand (ancient Etymander) Valley of southwestern Afghanistan or from Muscat in Oman on the Arabian Peninsula. The former is more probable since the Buledais were Zikris who arrived during the fifteenth century, but did not achieve supremacy until 2 centuries later and terminated with Sheh Kasim about 1750.

Two inscriptions exist: (*a*) on the grave of Omar and Maho near Sami there is a reference to Sheh Zehri; and (*b*) a tombstone at Gwadar engraved "in the reign (*badshahi*) of Sheh Bilar," dated A.H. 1142 (A.D. 1729–30). Sheh Bilar was the uncle of Sheh Kasim.

In the meantime the Gichki power was growing and at the commencement of the eighteenth century they had more power than the Buledais. The Gichkis, who were also Zikris, contended with the Ahmedzai Khans of Kalat until an agreement was signed about 1776.

During the long reign of Nadir Shah (1750–94) Brahui power reached its maximum; the Khanate included most of Baluchistan except Zhob and Loralai.

During 1839 the British crossed Baluchistan during the first Afghan War. The first treaty with Kalat State was negotiated in 1854. From 1856–73 British Political Agents were deputed to Kalat. In 1876, Captain (later Sir) Robert Sandeman negotiated another treaty and inaugurated the policy of tribal administration through their own chiefs under British supervision. Just prior to his death at Bela early in 1892, Sir Robert Sandeman incorporated Baluchistan into the British Empire and Boundary Commissions were appointed. After World War I, famine and influenza took a heavy toll of life and caused considerable emigration.

On May 31, 1935, a catastrophic earthquake caused great destruction in Quetta, Mastung and Kalat; about 22,000 persons perished in Quetta.

A trade depression lasted until the outbreak of World War II in 1939, which began the rise in prices.

When Pakistan and India came into separate existence on August 15, 1947, Baluchistan became the western Province of the new State, later being divided into Makran, Kharan, Kalat and Las Bela, forming Baluchistan States Union. During 1955 another reorganization of political divisions was in progress.

Population

According to the Census of 1951, Baluchistan including the States had a population of 1,174,036 or 9 persons per square mile (fig. 9). Previous Censuses gave the following smaller figures, probably because of poorer coverage, especially in the most inaccessible areas: 834,703 (1911); 797,394 (1921); 868,617 (1931); and 855,712 (1941). The majority (88.0 per cent) live in rural districts with an average of 5 persons per family.

The main urban and commercial center is Quetta, founded in 1868 but destroyed completely by the earthquake of May 31, 1935, having a population of 84,343 in an area of 17 square miles. The province is predominantly Moslem (98.5 per cent).

Approximately 91.0 per cent of the population consists of the tribal or indigenous inhabitants, the remainder being permanent and temporary settlers from other areas. The 7 main tribal groups, as given in the 1951 Census, have their own characteristics and traditions. Within the Baluchistan States Union, the following percentages were recorded: Brahui (36.0), Baluch (27.0), other indigenous Moslems (15.0), Jatt (10.0), Lasi (7.0), non-tribal (3.0) and Pathan and Sayyid (1.0). The principal tribal groups are: the Baluch (291,736), the Brahui (262,346) and the Pathan (243,882), forming 70.0 per cent of the population.

1) *Baluch.* This tribal group which includes 151,243 persons (27.0 per cent) of the States Union and 140,493 (25.0 per cent) of the districts, forms 2 linguistic elements:

a) Western Baluch (103,124) live in Makran (60,827), Kharan (21,806), Chagai

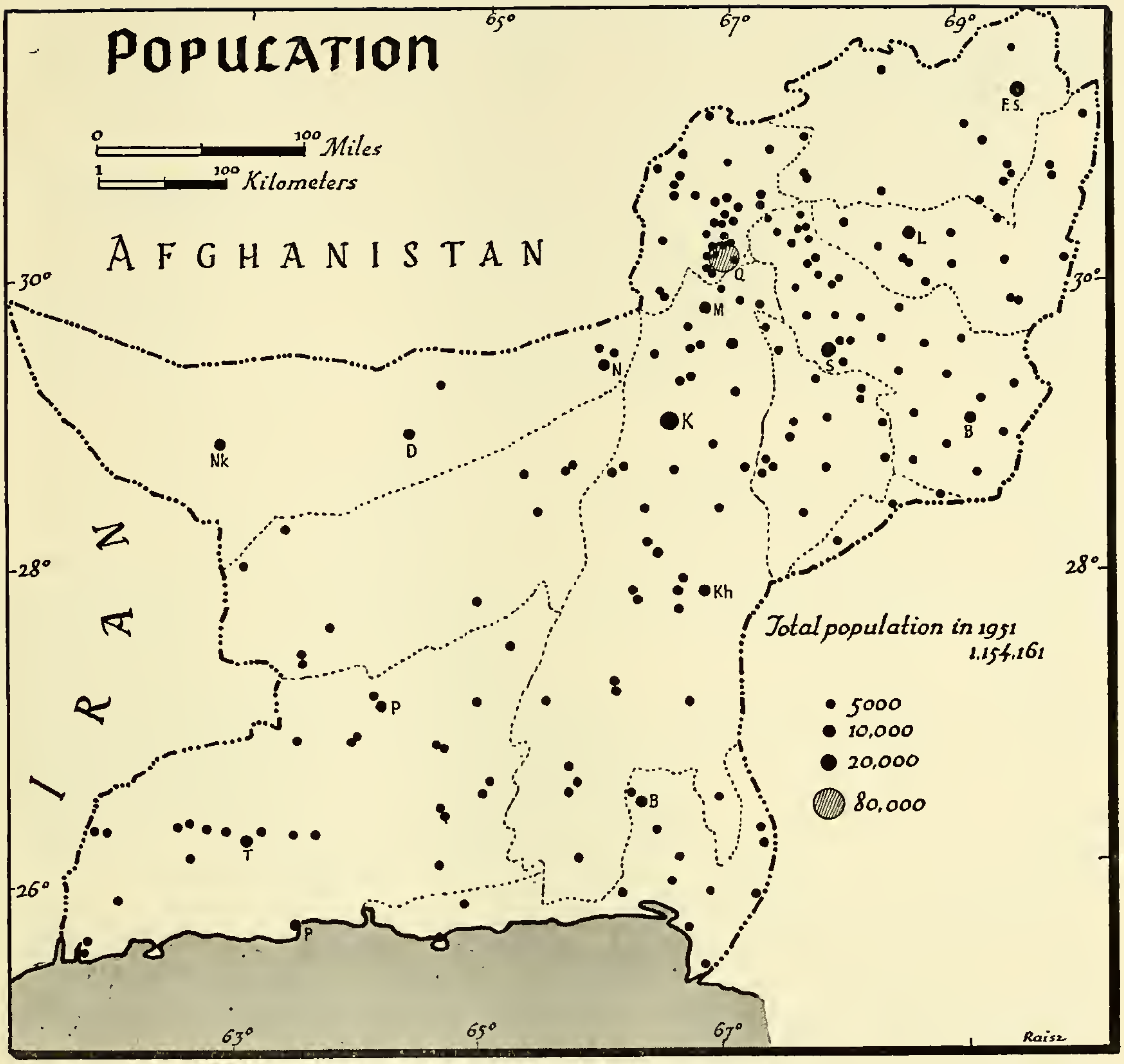

Fig. 9. Population of Baluchistan, 1951.

District (7,900) and other western regions (12,591). The main tribes are the Buledai, Dashti, Gichki, Kaudai, Rais, Rakhshani, Rind, Sangur and Sanjarani.

b) Eastern Baluch (188,612) live mainly in Sibi and the Mari and Bugti tribal areas. The main tribes are the Bugti, Dombki, Khetran, Magasi, Mari, Rind and Umrani. The Rind are divided into the Buledai, Jamali, Khosa and Lashari.

2) *Brahui.* The second largest group (262,346) has shown a marked increase from the 152,588 persons recorded in the 1931 Census. Their home and main concentration lie in the Jhalawan Division of Kalat State. They constitute 23.0 per cent of the entire province and form 36.0 per cent of the States Union. The Brahuis are divided into:

a) Original nucleus (30,014) represents the oldest tribes, including the Ahmedzai, Gurgnari, Iltazai, Kalandrari, Kambrari, Mirwari, Rodini and Sumulari. They live in Kalat and neighborhood.

b) Sarawan (72,956) dwell in Kalat State, although about one-third live in other regions. For example, in Makran there are 4,967

Sarawan Brahuis. The main tribes are the Bangulzai, Kurd, Lahri, Langav, Mamashochi (Muhammad Shali), Raisani, Rustumzai, Sarpara, Satakzai, Shahwani and Zagar Mengal.

c) Jhalawan (133,305) also live in Kalat State with almost half in other regions. For example, in Makran there are 12,098 Jhalawan Brahuis. The main tribes are the Bizanjaus, Haruni, Mamassani (Muhammad Hasni), Mengal, Nichari, Pandrani Sajdi and Zahri.

d) Miscellaneous Brahuis (26,071) including Nigwari (3,419) and Rekizai (1,167) counted by census in Kalat State and those who declared themselves as Brahuis without details.

3) *Pathan.* The next largest group (244,-661) forms 21.0 per cent of the province, but less than 1.0 per cent in the Baluchistan States Union. In Kalat State there were 2,544 and in Makran, 2,448 Pathans. The majority live in Quetta-Pishin (99,316), Zhob (58,463) and Loralai (50,745). The Pathans are divided into:

a) Kakar (112,236) including the Sanzarkhel (52,722) in the Zhob, Loralai and Quetta-Pishin, the Sanatia (28,168), Sarpara (2,355), and Targhara (17,413) in Quetta-Pishin and miscellaneous (2,582). In addition, there are the Dawi (315), Dumar (7,908) and Hussain Pisner (773).

b) Tarin (46,814) comprising the Abdal-Achakzai (25,568) and the Tor Tarins (9,364) in Quetta-Pishin, the Spin Tarins (11,882) mainly in Sibi.

c) Pani (31,487) with the main branch (7,007) mainly in Sibi, the Isot (2,101), Laun (702), the Mandokhel (6,305) in Zhob and the Zarkun (2,746) in Zhob, Loralai and Sibi, and Musakhel (12,626) in Loralai.

d) Semi-indigenous tribes (22,123) including the Durrani (7,300), Ghilzai (10,829) and Hazara (3,994), who during the last century migrated from Afghanistan into Quetta-Pishin.

e) Other groups of Pathans include the Babi (447), Barech (4,965), Jaffar (2,303), Kasi (1,990), Luni (4,433), Shirani (9,057), Zmarai (2,761) and miscellaneous (6,045).

4) *Lasi.* These are the indigenous tribesmen (39,465), who form 7.0 per cent of the States Union. The main tribes are the Angaria (4,939), Burra (3,740), Gonga (5,168), Jamot (5,849), Mangia (1,609), Mandra (2,636), Runjha (5,659), Shahok (1,770), Sheikh (2,137) and others (5,958).

5) *Jatt.* This tribe, distinct from but perhaps as ancient and indigenous as the Baluch, live in Kalat State and Sibi. With 87,980 (7.5 per cent) in the Province, the majority (95.0 per cent) live in Kalat State (53,040) or Sibi (30,044). In Las Bela there are 4,896 Jatts.

6) *Sayyids.* Half of the indigenous Sayyids (23,635) live in Quetta-Pishin, but only 0.5 per cent in the States Union. The main branches are the Bukhari, Chishti, Gharshin, Kaheri, Mashwani, Taran and Ustrana.

7) *Muslims.* In this category are the miscellaneous indigenous tribesmen (88,050) such as the Lori, Darzada, Med and Nakib, who inhabit the coastal areas of Makran and Las Bela. They form 15.0 per cent of the States Union. The Jats, not to be confused with the Jatts, are camel-owners living in Sibi. The other groups are the Dehwar, Gedra, Gola, Khoja, and Langah.

Non-Tribal. These include other Moslems (90,337), Hindus, Sikhs and Scheduled Castes (13,087), and Christians, Parsees, etc. (4,017). This miscellaneous group (107,441) contains unclassified indigenous tribes, permanent settlers and temporary visitors.

Languages (Table 7)

Baluchi is the chief language in Makran, Kharan and in the Chagai and Sibi districts. In order to show the distribution of the Indo-Aryan languages figure 10 has been compiled.

European scholars divide it into Western Baluchi or Mȧkrani and the dialect of eastern Baluchistan and the Punjab known as Eastern Baluchi.

It is presumably to Baluchi that Ibn Haukal referred when he wrote in the tenth century, "In Makran they use Persian and Makranic." During the eleventh century Al Idrisi confirms this by writing, "The people of Makran speak Persian and a dialect peculiar to the Province." Marco Polo also refers to the "peculiar language" spoken in Makran. Mr. E. Pierce, who studied the Baluchis of Makran, observed that there are only small variations in dialect, but some words are special to every district. The latter are not mutually intelli-

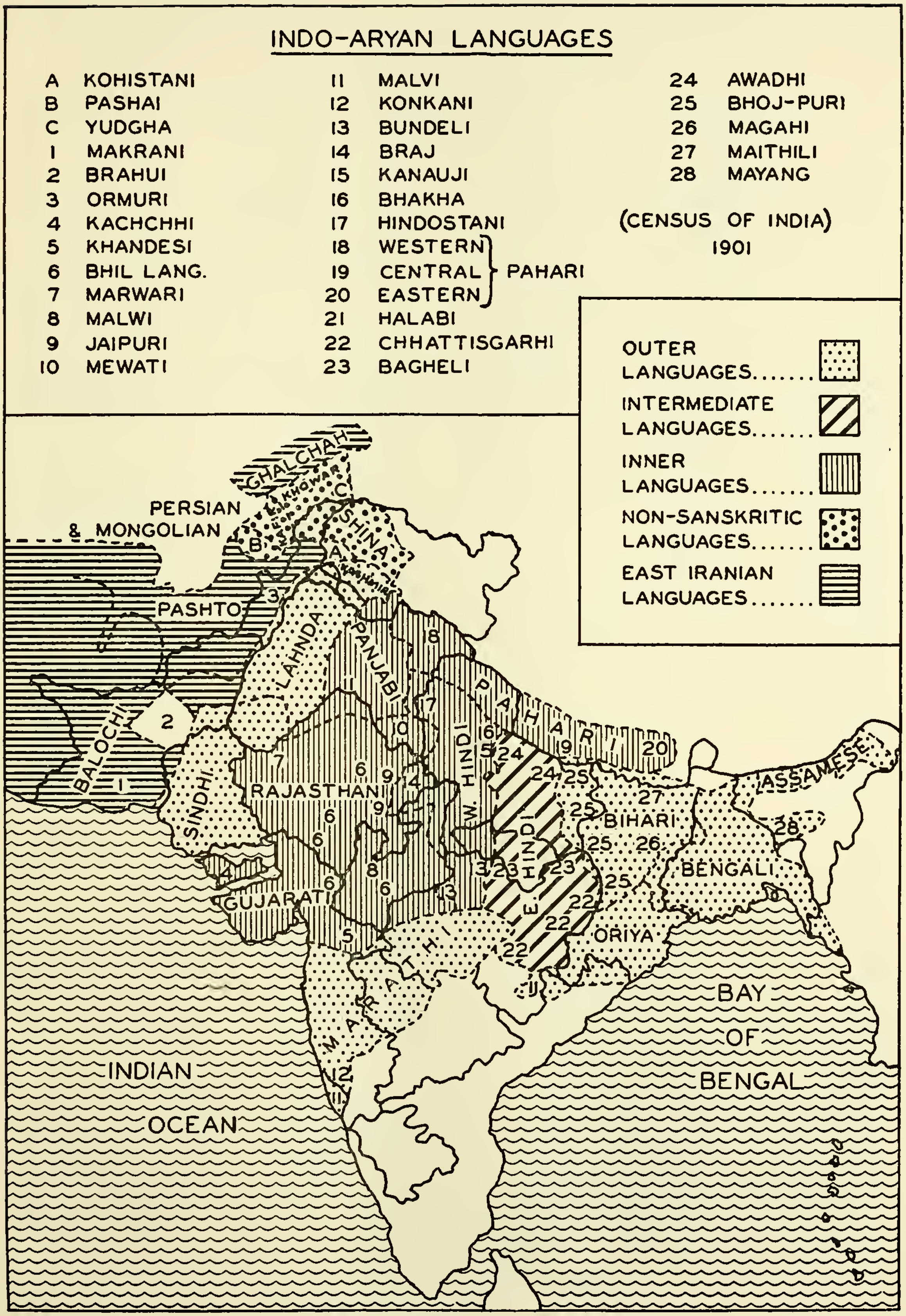

Fig. 10. Indo-Aryan languages (*after* Census of India, 1901).

TABLE 7. LANGUAGES * OF BALUCHISTAN

States and Districts	*Baluchi*	*Pushtu*	*Brahui*	*Sindi* †	*Punjabi*	*Urdu*	*Persian*
Kalat	19	0	51	29	0	0	0
Kharan	81	0	19	0	0	0	0
Las Bela	19	0	1	80	0	0	0
Makran	100	0	0	0	0	0	0
Chagai	60	3	33	1	2	1	0
Loralai	8	62	1	0	28	1	0
Quetta-Pishin	2	60	7	0	18	7	4
Sibi	54	12	7	20	5	2	0
Zhob	0	96	0	0	3	1	0

* Mother tongues given in percentages.
† Including Lasi and Jattki dialects.

gible. He states that the Makrani-Baluchi "appears to be a dialect of Persian mixed with many words of Indian origin, probably introduced by the Jadgals." It appears to have little connection with modern Persian, many of the words derived from the latter language being words now obsolete or rarely heard.

Mockler (1895, JASB, no. XXXI, vol. 11; 1877) wrote:

> We may say that the Baluchi language is an Aryan tongue of the Iranian group and appears to be a sister language to the Pahlevi . . . and may be considered an offshoot from the Old Persian developed in Makran and to this extent an original language. . . . The language of Makran is both in pronunciation, grammatical construction and idiom, an unmistakable Iranian tongue and philologically homogeneous in its parts. . . .

It would appear that the more primitive language is spoken at Mand and along the coast. Tradition places the Rinds of Makran as the first Baluchi settlers in Makran and that they threw off branches along the coast, such as the Kalmatis.

A considerable body of literature exists in Western Baluchi. Favorite ballads are recorded in Persian characters in books (sing. *daftar*). Among the more famous poems are those relating the Rind migration and two giving details of the various rulers of Kech-Makran.

Pushtu dominates the Loralai, Quetta-Pishin and Zhob districts. Brahui is the mother tongue of more than half of the population of Kalat State and is the second language in Kharan and Chagai. In Las Bela State the Lasi dialect of Sindi is the principal language. Jattki, another Sindi dialect, is the second language in Kalat State and in Sibi. Punjabi is spoken in Quetta with its dialects of Jafarki, used by the small Jafar Pathan tribe of Musakhel, and Khatrani, by the Khatran Baluch of Barkhan Tehsil.

Lori-Chini, the language of the Loris, is said to be derived from the Sindi word *chaeni* (= "invented") for it is not a tongue, but a secret artificial jargon invented by the Loris and spoken before strangers. The words used are generally inverted forms of Baluchi, sometimes of Urdu, Sindi and Punjabi, even Persian.

A few examples are quoted.

English	*Lori-Chini*	*Inverted Forms*
Three	Hes	(B.) Seh
Four	Rach	(B.) Char
Five	Champ	(B.) Panch
Ear	Shog	(B.) Gosh
Hair	Dum	(B.) Mud
Head	Ras	(B.) Sar
Belly	Tep	(U.) Pet
Brother	Dirabad	(P.) Bradar
Flesh	Shogd	(B.) Gosht

Among words peculiar to the jargon may be mentioned: *tibbar* (father), *somb* (nose) and *goma* (a rupee).

Jadgali is used by the few Jadgals of Kulanch, and is practically identical with Lasi, the language of Las Bela and an offshoot of Sindi.

EDUCATION

Literacy, defined in 1951 as persons able to read clear print including those able only to read the Koran, is 5.5 per cent with 13,328 literate in English. Full-time education was being received by 14,320 boys and 2,600 girls in 186 and 19 primary schools, respectively. In addition, 82 tribal scholarships have been authorized.

CHAPTER III

RACES, TRIBES AND GROUPS

TO THE traveler, an inhabitant of Makran will state his nationality as Makrani; at home he is known as a Baluchi (Baloch).

The 2 main divisions are the dominant classes and the cultivators. The Baluchi are divided into smaller groups or units, such as the Kaudais, Jadgals, Mullais and others.

There are no organized political or ethnic units, known as tribes, as occur in other parts of Baluchistan. However, some tribal units may be grouped geographically (table 8).

ORIGIN

The population is composed mainly of separate groups living apart from and independent of one another. Nomadism is the chief factor in causing tribal fission. When tribal units split up, the new unit begins to function separately. For example, the Hots of Tump deny all connection with the Rinds of Mand, while the Hots of Kalato in Dasht disclaim relationship with the Hots of Gushtang near Turbat or with the Hots of Tump.

The Makran tribes are essentially Baluch, not Brahui, although several families of the latter have settled for many years in Makran, and identified themselves with the older inhabitants. But the term "Baluch" again is generic and not specific in this region, and under that denomination come many alien tribes of Arabian, Sindi, and even Punjabi origin. The population may be divided into 5 classes:

1) Gichkis, Boledis, and Malikahs: these are the families said to have furnished the hereditary ruling chiefs of Makran.

2) Great or powerful tribes, including some of Brahui origin: Nausherwanis, Bizanjaus,

TABLE 8. TRIBES OF COASTAL AND INLAND DISTRICTS OF MAKRAN

District	*Tribes*	*Towns and Villages*
	Coastal Districts	
Ormara	Bizanjaus, Meds	Ormara
Pasni	Kalmatis	Pasni
Kulanch	Puzhes, Bands, Zadgals or Jatgals, Bizanjaus, Wardilis	Ban, Noghwar Kalag
Gwadar	Reganis, Kalmatis, Mehdizais, Meds	Gwadar
Juni	Shahzadah Baluch, Raisis	Juni
	Inland Districts	
Kolwa	Bizanjaus, Mirwaris, Kaudais, Nausherwanis, Rakhshanis	Balur, Chambur, Hor, Gushanah, Madag, Malar, Awaran
Dasht	Kaudais, Rinds, Hots, Buris, Shahzadahs, Birdis	None of any importance
Panjgur	Gichkis, Nausherwanis	Panjgur, Tasp, Khudabadan, Soridu
Kej (Kech)	Gichkis, Mullais, Raisis, Sangurs, Dorzadehs, Ketwaris, Loris	Kej, made up of several forts and villages of which Turbat is the principal
Tump	Gichkis, Hots	Tump, Nasirabad
Mand	Rinds	Mand (Gayak and Gayab)

Mirwaris (Brahuis), and Naruis, Hots, and Rinds (Baluchis).

3) Less important tribes: Mullais, Kaudais, Singalus, Jatgals, Shahzadahs, Kalmatis, Ketwaris, Sangoris, Sajdis, Askanis, Shehis, Lagoris, Mehdizais, Wardilis, Puzhes, Bands, Birdis, Gojahs, Gorjis, Baris, Kosagis, Kotigis, Zishtkhanis, Rais.

4) Inferior tribes: Korwahs, Meds, Lundis, Zatis, Langaos, Baharis, Darzadas, and Loris.

5) Unorthodox Baluchi tribes: (*a*) Dai Mazhabis (or Zikaris); (*b*) seafaring tribes of the coast, such as the Meds, Korwahs, and Rais; (*c*) Biadiahs or Kharejites; and (*d*) Khojas or Lotias.

Divisions of Population

The main divisions of the population are: (*a*) dominant classes (*hakim*); (*b*) middle classes composed of heterogeneous units long since amalgamated into one group called the Baloch; and (*c*) inferior groups including servants, minstrels and artisans—all called *hizmatgar.*

The dominant classes consist of the Gichkis, Nausherwanis, Mirwaris and Bizanjaus, all landowners.

Gichkis. Although few in number, the Gichkis have long been the most powerful class in Makran (table 9). They are divided into the Kech or Dinarzai Gichkis and the Panjgur or Izazai Gichkis. To the former must be added the Buledai Mirs; to the latter the Tolag Gichkis.

Table 9. Distribution of Gichkis in Makran

Locality	*Group*	*Residence*
Kech	Dinarzai	Kush-Kalat, Turbat, Kalatuk, Nasirabad
	Izazai	Shahrak, Sami
Tump	Dinarzai	Tump, Pullabad
Buleda	Buledai Mirs	Chib
Panjgur	Izazai	Isai, Sordo
	Tolag	Isai, Tasp, Khubadaban, Garmkan, Sari Kauran, Washbad

Their name is derived from the Gichk Valley in Panjgur into which their Indian ancestors migrated. Jaipur, Jodhpur, Marwar, Jamnagar and Lahore have been suggested as their place or places of origin. Their time of arrival appears to have been between the fifteenth–seventeenth centuries. They are said to have been converted to Islam three generations after their arrival, but became Zikris following the rise of that sect. The Panjgur Gichkis acquired power until early in the eighteenth century when Mulla Murad ousted the Buledais and became the religious head of the Zikris.

Nausherwanis. Toward the close of the seventeenth century this small family became the ruling chiefs of Kharan. Groups of Nausherwanis migrated into Makran and contracted marriages with the Gichkis. For example, the sister of Ibrahim, Khan of Kharan, married Mir Yalli, a Panjgur Gichki.

Mirwaris. With headquarters in the Mashkai Valley and Nondaro, the majority live in the Jhalawan country. The most influential group is the Fakirzai, who live in Kolwa. They claim Arab blood, being descended from Braho. The Mirwaris are the genealogists, historians and poets of Makran.

Bizanjaus. These are offshoots of the Jhalawan tribe (Ormari branch) with headquarters at Nal. In addition to the leading families, there are scattered herdsmen and cultivators in Kolwa, Kulanch, Pidarak and Dasht. They are Zikris. The other sections are the Bahadurzai in Sardash, the Shahalzai in Pidarak and the Siahpad in Kolwa.

Baluchis. This group forms the basic element of the population. Possessing the land, they are organized into small communities, each under a headman (*kauhda*).

Although during historical times we have evidence of the infiltration of numerous racial elements, including Mediterraneans, Mongols and Negroes, our principal concern with Makran is the Baluchis (table 10).

Mockler (1895) believed the origin of the word Baloch to be derived from Baloc or Baloc Badrosh = Gadroc or Gadrosh or Gadros of the more ancient Pahlavi or Zend and to the Gadros-ii or Gedros-ii of the Greeks.

Mockler suggests that the Baloch were established in Makran more than a century before the Mohammedan era. He doubts that the Rinds, who claim to be true Baloch, came from Aleppo, which is one of their traditions. He suggests that they may have been Arabs by descent from Alaf, who founded the Alafi, Kahtanites of Oman, not from Alaf (Haleb or Aleppo) in Syria.

Table 10. Baluchi Tribes

Tribe	*Subtribe*	*Locolity*
Rinds	Mirozai	Shoran and neighborhood
	Hotanzai	
	Godri	
	Nakehzai	
	Ghulambolak	Shoran and Dadar
	Kuchk	Shoran, Dadar and Kirthar
	Kalui	
	Siahpad	
	Azdi	
	Chaolani	
	Jatui	Sani, and also in Sind
	Dinari	Near Kotra
	Jamali	Rojhan and in Sind
	Puzh	Shoran and in Sind
	Jalambani	Dadar and Sind
	Dumki	Lahri and Sind
	Girani	Haji-ka-Sher
	Umrani	Tambu and Manuti
	Khosa	Kachhi and Sind
	Bugti	Headquarters Bugti Dera
	Mari	Headquarters Kahan
	Gurchani	Punjab Frontier
	Mazari	Rohjan, Punjab Frontier
	Laghari	Choti Punjab
	Lund	Punjab Frontier
	Drishak	
	Bozdar	
	Petafi	
	Birdi (Boledi)	Kachhi and Sind
	Rakhshani	Nushki
	Kalmati	Tatta in Sind, and Makran
	Sabaia	Jacobabad
	Jakrani	Jacobabad
Magzis	Bhutani	Jal
	Mirzani	
	Shambani	
	Isobani	Shadihar
	Kahtar	Shadihar
	Moghalani	Panjok
Lasharis	Gazkandi	Mand District
	Pirozai	Mand District

Pottinger (1816) is inclined to assign a Turkoman origin to the Baluchis, dividing them into the Naruis, Rinds and Magzis.

Rawlinson (1952) derives the name Baluch (P. *Biluch*) from Belus, King of Babylon, who is identified with the Biblical Nimrod, son of Cush. He adds, "the names of Belus and Cush thus brought into juxtaposition have remained attached to some portion or other of the region in question from ancient times to the present day. The country east of Kirman was named Kussun throughout the Sasanian period. The same region is now Baluchistan, the country of the Baluchis or Belus, whilst adjoining it to the east is Cutch."

Masson (1842) quotes an Arab author with reference to the peoples of Makran, "many resemble the Arabs, eating fowls and fish; others are like to Kurds. . . . The Baloujies are in the desert of Mount Kefes, and Kefes in the Parsi language is Kouje, and they call these two people Koujes and Baloujies." This may be the origin of the name Kej (P. *Kuch*), capital of Makran.

Many of the tribes or clans of Makran, while calling themselves Baluchis, claim to be of Arab origin; their appearance and habits do not belie this assertion. The Baluchi language is a dialect of Persian. By tradition the Baluchis came from Haleb (Aleppo) in Syria.

In addition, there are other Baluchi tribes: (*a*) the Sanjaranis, a powerful tribe extending from Mahabat to the Helmand; (*b*) Nausherwanis in Kharan; (*c*) Naruis, Shiranzais, Kabdanis, Chakarzais, Jalal Baluch and Saharani in the Helmand Valley, Seistan and Garmsel.

Pottinger (1816) describes the Naruis as tall and handsome, not possessing great physical strength but adapted and inured to the climate. Toward the latter part of the last century, the Naruis were feared for their fierce camel raids (*chupaos*). Living on dates, sour cheese, bread and water, they rode 80–90 miles daily, each man being in charge of 10–12 camels.

The Rinds and Magzis resemble the Naruis in size and stature, but are darker in skin color, the result of the climate.

Latham writes:

> The Baluch are all but Persians in language, yet they are not Tajiks any more than the Kurds are Tajiks. They are tribesmen. They are herdsmen. They are more or less migrants, and not a little predatory. In habits they are Iliyats. The Kurds are this; and except that Kurdistan lies to the west, and Baluchistan to the east of Persia proper, a Kurd is a Baluch, and a Baluch is a Kurd. There are, of course, differences between the two. They are, however, unimportant. The skin of the Baluch is dark. The thirtieth parallel, which (there or thereabouts) bounds the Baluch country on the north, limits Kurdistan on the south. . . . The Kurds of the Bolan Pass are generally considered to be Brahuis.

Maitland writes:

> In appearance and character, as in origin and language, the Baluchis differ greatly from their Brahui fellow-subjects.
>
> In physique the Baluch of pure race is somewhat taller than the Brahui, and much his superior in personal appearance. In endurance of fatigue, hunger, and thirst, there is little to choose between them; the latter, however, is a mountaineer, while the former is nearly always mounted, though invariably fighting on foot.

The following note on the Baluchis by Rai Bahadur Hetu Ram will be of interest, since it is taken chiefly from the oldest traditions of the country, such as the *Shah Nama* songs, etc.:

> The name Baluchistan was given to this country long before the time of Nadir Shah. This name was given to the country by the Baluchis, who came and settled here for the first time. On reference to the history of Baluchistan it will be seen that the District *Ilaka* of Kalat was formerly included in the country called Sewistan. It is said that Kalat itself went by the name Sewa, after the name of its founder. Some descendants of Sewa, called Sewazais, are met with even to this day. From the Sewazais Kalat came into the hands of Moghal Pathans, and from the Moghals into the hands of Mirwaris. From the Mirwaris it fell into the hands of Rinds and Lasharis when both these clans were united. Afterwards the Mirwaris fought with the Rinds and regained possession of the country from them. The grave of Mir Mandar Rind is to be found near the palace *(miri)* of the Khan of Kalat. After the Mirwaris the Moghal Pathans once more took possession of the country. But afterwards, when the Dehwars murdered their Moghal ruler, they elected Mir Hussan Kambrani (Brahui) to the Masuad of Kalat. This marked the time when the name "Brahui" commenced to be regarded with respect. But the name "Baluch" dates some time prior to that of "Brahui," and in my opinion the Brahuis are descendants of the Baluch, although the Rinds differ from the Lasharis. But on reference to the history it will be seen that when the Baluchis came down from Aleppo and settled in Karman, they were then divided into forty-four different sections. It is possible then that the Brahuis also might be a branch of the tribe.

The Baluchis were long ago a powerful people, as appears from a verse in the *Shah Nama:*

The king got word
That the ground had become black with Baluchis.

At that time Nausherwan, whose name is still famous in the world for justice, was king. He quarreled with the Baluchis and fought against them and expelled them from his country. Mohammed was a contemporary of Nausherwan. The Baluchis existed (as a tribe) before the time of Mohammed. Originally they dwelt in the lowland at the foot of the hills, and also in the hill country of Aleppo, Garmsel and Seistan. In the language of Aleppo, men who live in the lowlands bordering on the hill and in the hills are called "Baluchis," thus this people received the name of Baluch. Up to the present day the Baluchis live principally in the hills, and the lowlands at the foot of the hills. In the days when Yaziz fought with the Imams the Baluchis left their own country and came hither. This occurred in the sixtieth year (after the Hijra) as appears from the following translation of a Baluchi song:

When Yaziz quarreled with the Imams,
An angel said, "the liver of the Prophet has been cut in two."
And so on all sides people were saying:
"They have cut off the head of Hossain and cloven it into two."

The Baluchis took the side of the Imams, but when Yaziz killed the Imams and ascended the throne of Medina, he ordered the Baluchis to be slain. When they heard of this they fled to Karman, of which place Shamsdin was governor at that time, and Ilmash Rumi was chief of the Baluchis. Shamsdin treated the Baluchis very kindly, and they settled in Karman for a long time. After this both Shamsdin and Ilmash Rumi died, and the former's son, Badardin, became governor of the country, while Gal Chiragh, son of Ilmash Rumi, became Baluch Chieftain. Badardin, fearing lest the Baluchis, now having grown powerful, would rise against him, demanded wives from each of the 44 sections. This was contrary to Baluch customs, so they resorted to the following artifice:

They took a boy from each section, and dressing each one in girl's clothes, sent them to the Governor, while they themselves fled to Kej in Makran and lived there for some time. Five families of Baluchis are descended from Mir Jalal, namely: Rinds, Lasharis, Hots, Kurais, and Jatuis. The first four were sons of

Mir Jalal, the fifth was a daughter. Their children and others who joined them were all called after the name of the family. Whoever joined the descendants of Rind was considered a Rind; whoever joined the Lasharis himself became a Lashari. In this way 5 great Sections were formed, just as in the case of the Garshanis, who are descendants of Gorish, these being joined by the Lasharis, Shakhanlanis, and Petafis from other sections, and the tribe thus formed is still called Gurshani or Gurchani.

The Baluchis, having now gained considerable power, took Kalat from Jam Nindar and drove him out. At that time Mir Chakar was chief of the Rinds and Gwahram Chief of the Lasharis, and these two sections were equal in strength. Riban, nephew of the Rind Chief, Mir Chakar, and Rawan, a relation of Gwahram Lashari, came to Chakar's town to make arrangements for holding some horse races for a prize. However, the Rinds would not play fair and carried off the prize. Rawan Lashari, in retaliation, killed a herd of camels belonging to Gohar Jatui, who was living under Mir Chakar's protection. Both sections assembled, and a desperate fight ensued, in which the Rinds were defeated. Miran, cousin of Mir Chakar, and 800 Rinds were killed. Mir Chakar went to Sultan Husain, King of Khorasan, and sought his aid against the Lasharis.

The King sent his servant Zanu and a large army with Mir Chakar against the Lasharis, and in the fight which followed the Lasharis were routed. Five hundred men and Rawan Lashari, the headman, were killed. The greater part of the fugitives fled to Haidarabad and Nagar Tatta, where to this day many Lasharis still reside. Others threw themselves on the mercy of Mir Chakar and were allowed to settle in his country, and thus it is that some Lasharis are still to be found in Kalat. At this period the power of the Rinds increased considerably and the whole of the Baluch tribes were united.

Some time after these events Humayun became King of Khorasan (Khurasan), and marched to Hindustan by the Bolan Pass, taking with him Mir Chakar, the Baluchi Chief. Some of the Baluchi clans, such as the Mazaris, Gurshanis, and others, observing that there was good water and grass on these hills, settled here. Mir Chakar marched to Delhi with the King's army and fought there. Humayun, after his victory, gave Sataghara in the Montgomery District to Mir Chakar. He lived there for some time and there died. His tomb still exists.

Some clans, such as the Lasharis, Drishaks, Gopangs, and Jatuis, returned from Sataghara and settled here on the mountains and lowlands. When Mir Chakar marched to Hindustan, his cousins, Muhammad and Brahim, with some sections of the Baluchis, remained in Kalat. From them sprang the two sections of the Muhammadanis and Birahamanis (Brahimanis), and Mir Jalal Khan, the chief of the Dumkis, is descended from the latter family. The Dumkis were originally Rinds, who settled on the Dumk torrent and thus derived their name.

Sometime after, the Maris and Bugtis and some other sections left Kalat and drove out the Musakhel, Kakar, and Zarkhan Pathans and settled in these hills. The Mazaris and Gurshanis journeyed eastward to the plain country. At first most of the land was barren, although the Nahrs had cultivated some villages. Ghazikhan, a descendant of Doda (Rind), appeared at this time and built the town of Dera Ghazi Khan. During this period several Baluchis traveled eastward and Baluch power on the Kalat side began to wane. The Brahuis, seizing the opportunity thus offered, raised an army and marched against Kalat, and after taking this town from the Baluchis they made the latter their subjects. As Mir Chakar had before been Chief of Baluchistan, the power now passed into the hands of the Brahui Chief. When the Rinds first existed as a tribe they formed one clan under one chief; there were 44 sections, each with its headman. They then divided into two clans, Rinds and Lasharis, and when other sections joined them their headman became chief of the section. When the Baluchis first arrived in this country they were constantly fighting with one another. The Mazaris, the Drishaks, and the Gurshanis fought among themselves in much the same way as the Marris and Bugtis fought with one another until the advent of British authority.

Longworth Dames (1904) concluded:

1) The Baloch are an Iranian race, judging

by their physical and mental characteristics, and they should be classed with the Tajiks and other peoples of the Iranian Plateau.

2) Historically they may be traced to the southern Caspian region in late Sasanian times.

3) They settled in Kirman after the Mohammedan conquest and in Seistan not before the beginning of the tenth century.

4) The Seljuk invasion at the end of the eleventh century caused their migration into Seistan and western Makran. Later Genghis Khan forced them eastward.

5) Their final move into the Indus Valley followed Tamerlane's conquests and synchronized with the invasions of India by Babar and the Arghuns during the fifteenth century.

The Baluchis, who do not enjoy living in large communities, are proud of their proverb, "The beauty of the night lies in the stars, and that of the forest in the Baloch."

The following are the important groups:

1) *Hots.* Their name is believed to be derived from an eponym meaning warrior. They have been identified by Holdich and Mockler with the Oraitai (Horaitai) of Alexander's time and with the Utii of the army of Xerxes (*see* JASB, vol. 64, no. 1, p. 31, 1895). The Hots claim affinity with the Rinds, but do not generally intermarry with them. Their ancient headquarters were at Miri across the Kech River from Turbat, but are now in Tump between Turbat and Mand. The Hots of Tump and the other two subgroups, the Hots of Shahi-Tump and of Kalato, remain independent of each other.

2) *Jadgals.* This small group live in Belar, Nalent and Kocha in Kulanch. The Jadgals or Jats can be traced in Arab histories to the first centuries of the Mohammedan era, where they are described as holding the country from Kirman in Persia (Iranian) Makran to Mansura in Sind. Since they appear to be a purely Indian people, it is presumed that they migrated westward. Although the name Jadgals is now confined to Kulanch, the influential Rais-Baluch are connected with them. The Kenagizai, living at Isai in Panjgur, and the great Sangur tribe are of Jadgal origin. The Mehdizais, part of the Sangur, live near Gwadar. According to Sir Henry Elliott (1867, vol. 1, p. 508), other groups connected with the Jadgals are the Band of Kulanch, the Korak of Kolwa and the Chilmarzai Meds of the coast.

3) *Kalmatis.* This group is believed to derive its name from Kalmat, the Calama of Nearchus, and the locality of their first settlement. However, during the tenth century a group which had adopted the tenets of the Karmatian heresy became refugees from Bahrain and Al Hasa and migrated toward Sind. The name of this heretical sect may be the origin of their name. The Kalmatis claim Rind descent and are thus accepted by the latter. Soon after their arrival on the Makran coast, the Kalmatis conquered the Meds and began to organize private bands, which roamed from the Gulf of Oman to Goa. Sea battles led by Hammal-e-Jihand with the Portuguese are commemorated in the Kalmati ballads. It seems probable that these piracies led to the burning, "of the beautiful and rich city Pessani (Pasni)" by Luis de Almeyda in 1581 (*see* Stevens, trans., 1865). In later times the Kalmatis came under the sway of the Gichki rulers of Kech. By the middle of the nineteenth century, their power had declined considerably.

Their headquarters are in Pasni; other groups live in Kalmat and in Gwadar-e-Nigwar.

4) *Kattawars.* This small group live around Kush-Kalat near Turbat. Claiming Rind affinities, the Kattawars enjoy the same social status as the Hots, Rais or Lundis, which is somewhat inferior to that of the Kalmatis and Kaudais. The Kattawars enjoy the title of Mullah.

5) *Kaudais.* They live in Kolwa and Nigwar with headquarters at Balor in lower Kolwa. Their claim to be connected with the Rinds is generally accepted, the Kaudais hold a position analogous to that of the Kalmatis.

6) *Lundis.* Ethnically they are connected with the Kashanis of Panjgur, who are believed to be Shahwanis from Iskalku near Kalat. This small group lives in Kush-Kalat near Turbat. The derivation of their name is said to be "tailless" because they arrived in Kech without a following. They entered the service of the Gichkis and later acquired a social status similar to that of the Rais and Kattawars.

7) *Rais.* This large tribe is distributed throughout the Kech and Panjgur valleys and along the coast from Pishukan westward into

Persian (Iranian) Makran. The ruling group live in and around Turbat.

8) *Rinds.* This is the most important division of the Baluchis; sometimes the title of Rind is loosely applied by outsiders to all Baluchis. In Persian their name means a "debauchee" or a "turbulent, reckless, daring man." They live in Mand with headquarters in Garab, Aspikahn and Wakai with Dashtuk, the western part of Zamuran. They have also acquired property in Tump and Dasht. The Rinds of Shoran in Kachhi are an offshoot and the name is also borne by groups in the Punjab far to the east. They consist of a number of independent groups, now merged into the general category of Rinds. The principal groups in Makran are the following:

RINDS OF MAKRAN

No.	*Group*	*No.*	*Group*
1	Gazakandi	11	Shahalzai
2	Perozai	12	Mirozai
3	Khiazai	13	Shahozai
4	Mullazai	14	Omarzai
5	Bugani	15	Kahmaki
6	Bangizai	16	Gohramzai
7	Miranzai	17	Askani
8	Tahirzai	18	Dagarani
9	Kolagi	19	Nuhani
10	Sheh-o-Mir		

The Gazakandi, who also call themselves Dombaki and Bangwar, are the leading section. The Askanis, the most numerous clan of the Rinds in Makran, may almost be termed an independent tribe. They are scattered in Zamuran, Dashtuk, and in Persian (Iranian) Makran. The Dagaranis occupy Aspikahn and Wakai (Vakai), the latter in the hills near the Iranian border. The Rinds allege their ancestors migrated from Aleppo in Syria to Kirman in Iran.

Their arrival in Makran appears to have coincided more or less with the period of the Arab invasions of India. Local tradition asserts that after the fall of the Caliphs, the Rinds succeeded the Irakis in the government of Makran.

Their traditions recorded in the *Tuhfat-ul-Kiram* trace the expansion of the Rinds from Jalal Han, a descendant of Harun Makrani, Governor of Makran under Hajjaj (A.D. 705).

About the fifteenth century, part of the Rinds migrated northeast to Kalat, others into the Indus Valley. This was the zenith of their power. Their intense individualism, which is proverbial throughout Makran, brought about their gradual decline.

Brahuis. These form the dominant group (table 11) in northern Baluchistan, approximately dividing the Pasni-Quetta traverse.

TABLE 11. BRAHUI TRIBES OF BALUCHISTAN

No.	*Tribe*	*No.*	*Tribe*
1	Kambaranis	34	Kaisaris
2	Zahris	35	Muris
3	Zagar Mingals	36	Gajagis
4	Mingals (of Wad)	37	Jaianis
5	Sumularis	38	Musuwanis
6	Bizanjaus	39	Sarfaranis
7	Sarawan Brahuis	40	Purjahais
8	Mirwaris	41	Kuchkas
9	Mamassanis	42	Bhuldras
10	Sajdis	43	Bhukas
11	Garganaris	44	Ridis
12	Rodinis	45	Isiranis
13	Imam Husseinis	46	Mihranis
14	Kulcha Bhaghwas	47	Jamalzaes
15	Mahmudanis	48	Gwaranis
16	Murahas	49	Samozaes
17	Kuris	50	Poatyis
18	Barjais	51	Changozaes
19	Shuja-ud-Dinis	52	Dodais
20	Harunis	53	Jaikhos
21	Karu Chakus	54	Rodenzaes
22	Bajais	55	Hasanis
23	Kurdas	56	Chamrozaes
24	Nagris	57	Muruis
25	Kajan Boledis	58	Bambakzaes
26	Nasir Rodinis	59	Rahzaes
27	Chotwas	60	Shadanzaes
28	Kaladais	61	Shahozaes
29	Galusaris	62	Kautinzaes
30	Kolachis	63	Ramazanzaes
31	Lagis	64	Sherazaes
32	Karis	65	Gulzaes
33	Debakis		

Under Kambar the Brahuis overthrew the Hindu Dynasty during the seventeenth century and captured Kalat.

Pottinger (1816) considers the Brahuis to be Tartars, and in support of this can be advanced the very plausible derivation of their name from the word "ba," the Persian preposition "in" or "at," and "roh" said to mean a hill in a dialect still spoken in some parts of Tibet (and to which the name "Rohilla" has by some been attributed). The Baluchi tribes, almost invariably inhabitants of the lowlands, are distinguished from the Brahuis by the appellative "Narohi," which, adopting a similar etymological derivation, would mean "not hillmen."

Another point in favor of Pottinger's theory appears in the nomadic habits of the people. They are divided into an indefinite number of tribes (*khels*) and are a wandering and unsettled nation, residing in one part of the country in summer and in another during the winter; they likewise change their immediate places of residence many times every year in quest of pasturage for their flocks, a practice which is rare among the Baluchi tribes.

Lastly, there is the physical aspect of the race to strengthen Pottinger's supposition. Instead of the tall figure, lank visage, and raised features of the Baluchi, the Brahui is described as having "short, thick bones, a round face, and flat lineaments."

Leach (1843) disagrees with Pottinger, but apparently has no theory of his own to substitute. His only remark regarding the Brahui origin is as follows:

> The term Brahui, I consider, must have been given this people by the original inhabitants of the country on their first entering it. I believe the word to be a corruption of Ibrahimi, Brahimi or Brahiwi, as a race either invariably takes its name from its progenitor or its original country. I have never heard it used in contradistinction to Naroi.

Masson (1842; 1843) confounds the Brahui with the Baluch, but contends that the former tribe entered the central provinces of the country from the west, and asserts that they regard Khuzdar as their ancient capital, or that which they occupied previous to their acquisition of Kalat. He further points out that they are only found in Kachhi as proprietors of lands acquired within a known period. Masson throws out the "Ba-rohi" theory, but does not seem to have seen Pottinger's argument in its favor, for he interprets "roh" as "waste" instead of mountain. He says with regard to the origin of the name:

> It has been conjectured to be the equivalent of Varaha, and a race of that name figured in contentions with the Rajputs; but it appears to have inhabited the Panjab and the countries east of it.

Respecting the Brahuiki dialect Masson (1843) writes:

> It has no resemblance to the dialects of the Afghans or Jets, and Professor Heeren, who connects the Brahuis with the Afghans, has, I submit, erred.

Lastly, let us see what Dr. Latham has to say on the origin of this people.

> With few populations is the consideration of their language of greater importance than with the Brahui, and with few has its value been more utterly ignored.
>
> That it differed from that of the Baluchis, and equally so from the Pushtu of the Afghans, was known to both Elphinstone and Pottinger, for both state the fact. Both, however, treat the Brahui as Baluchis with certain differential characteristics, neither asking how far some of these may be important enough to make them other than Baluch. This is because the political term Baluchistan has concealed one of the most important and interesting affinities in ethnology.
>
> A short specimen of the Brahui language in Leach's vocabularies commanded the attention of Lassen, who, after enlarging upon its difference from the Persian, Baluch, and Pushtu, drew attention to some notable similarities between the numerals and those of the South Indian dialects. Following up this suggestion the present author satisfied himself, much to his surprise, that the Brahui tongue was in many respects Tamul[1], an opinion which others have either recognized, or been led to form from their own researches.
>
> In the country, however, which they now occupy, the Brahuis consider themselves aboriginal; the Baluch admitting that they are themselves of foreign origin. The rugged and impracticable nature of the Brahui mountains favors this view. Of any creed anterior to the introduction of Mohammadanism no traces have been discovered, though doubtless discoverable. The Brahuis are divided into an indefinite number of tribes, many of which have doubtless from time to time been engrafted on the original stock from for-

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[1] Captain Temple, Political Agent at Kalat in 1888, writes regarding this question of the origin of the Brahuis: "I think the language is the best clue to follow in inquiries of this sort; every other clue is little better than mere guesswork. To ask the people of the country is useless. I have asked the best-informed and have received the vaguest and most contradictory replies. I never succeeded in finding a Brahui who had the least notion that the Brahui language was connected with the Dravidian languages. The fact that it is so connected is, I think, evidence on which reliability can be placed that the Dravidians and Brahuis are connected, and it seems that the Dravidians were forced down from the north to the south extremity of Hindustan, the Brahuis seem to have been left on the way in the hills they occupy. Their language is different in structure from Pushtu, Persian, Baluchi, Panjabi, Sindi, Urdu, or Hindi."

eign sources. In Jalawan, for instance, it has been proved that infanticide prevailed until recently amongst certain sections, to whom a Rajput extraction is clearly assignable. The Buledis, again, who are included amongst the Brahuis, are undoubtedly Arabs, and the tradition with regard to the ruling tribe of Kambaranis is that they originally came from Abyssinia Kambar, in the Brahuiki dialect, signifying an Abyssinian. The Mongrel dialect, called Brahuiki or Kur Gali, is also to be accounted for by periodical admixtures from the outside.

The generally accepted theory now is that the Brahui dialect belongs to the Dravidian order of tongues (fig. 11) and the Baluchi to the Indo-Germanic. This difference in language is supposed by some writers to prove the fact of the Brahui being an older inhabitant of the country than the Baluchi. For comparison between the distribution of Dravidian and certain other languages (Mon-Khmer, Munda and Austronesian) fig. 12 has been prepared.

In 1810, Pottinger extolled the Brahui character and physique, and greatly prefers them to the Baluchis. Pottinger (1816) writes:

> They are hardly to be surpassed in activity, strength, and hardiness, being alike inured to the cold of the mountainous regions of Baluchistan and the heat of Kachhi. Numbers of them have brown hair and beards. The women of the Bizanjau tribes are esteemed very handsome, as also are those of Nichara, near Kalat; but the complexion of the ordinary poor Brahui women soon becomes bronzed in consequence of exposure, and they assume a hardy, masculine appearance. On a march they sustain incredible labor, and may be seen without coverings to their heads or feet, arrayed in a coarse black gown, driving before them a camel, cow, or ass, laden with their miserable effects, while on their backs they carry their infant children, and, as if they had not enough to do, on the road are busily engaged in twirling their hand-spindles, and spinning coarse threads of wool or hair.

Pottinger (1816, pp. 71–72) continues:

> A Brahui always dresses in the same style, and whether it be summer or winter, freezing hard, or under a vertical sun, his whole clothes are comprised in a loose white shirt, a pair of trousers of the same texture, and a felt cap, now usually replaced by a turban. The shepherds sometimes wear a covering of white felt, made so as to wrap round the body and come to a peak above the crown of the head: this habit will keep off a vast deal of rain or snow, and is exclusively used for that purpose. The domestic life of the Brahuis is simple in the extreme: the men tend the flocks, till the ground, and do other out-door labor, in which they are, if needful, assisted by the women; but commonly the duties of the latter are to attend to the household affairs, such as milking, making butter, cheese and ghee, and they also weave and work carpets, felts, and coarse white cloth. They are not secluded from the society of men, but all live and eat together. Their dress consists of a long shift and pair of trousers, both of cotton cloth, and after they arrive at the age of puberty they wear over the former a kind of stays, made to lace behind, the fronts of which are decorated with ridiculous devices of birds or animals worked in colored worsted.

Maitland writes of the Brahui tribes:

> All the tribes are divided into numerous *(takkars)* sections, each of which is under a headman *(Wahdera)* or minor chief of its own. These *takkars* have sometimes been mistaken for district tribes. This has arisen, no doubt, from the fact that a Brahui, if asked his tribe, always names his particular *takkar.* It is also the case that the various *takkars* of a tribe will not unfrequently espouse different sides in a quarrel, and even remain at deadly feud with one another. However, this appears to be a far rarer occurrence than with the Afghans: the tribal organization of the Brahuis is also more perfect, and the chiefs are in general well obeyed. Only the heads of the great divisions of the Sarawan and Jalawan are termed "Sirdar."

The best description of the Brahui way of life is given by Sir Denys Bray (1913c).

Other important groups must now be listed: the Zikris, Dehwars and Sangurs and some smaller tribes or groups.

Zikris. The majority of the followers of the Zikri sect live in Makran, but they are also to be found in Mashkai in the Jhalawan country and along the coast of Las Bela. To the Brahuis, the Zikris are known as Dai, the alleged derivation being from *dah* meaning a "message" in Baluchi. The Zikris call the Koran *dai.* It is remarkable that the Dais, Sagetae and Sakas (Sacae) were ancient Scythian tribes, and many Brahui clans of the Sajdi, are called Dais or Zikris. The Zikris derive their name from the *zikr,* a formula which they repeat in the course of their devotions.

It is known that the leaders of the sect in Makran have in their possession books which throw some light on their origin and other related questions. From the *Safar-Nama-e-Mahdi* ("Wanderings of the Mahdi") and the *Tardid-e-Mahdawiyat* ("Refutation of the Dis-

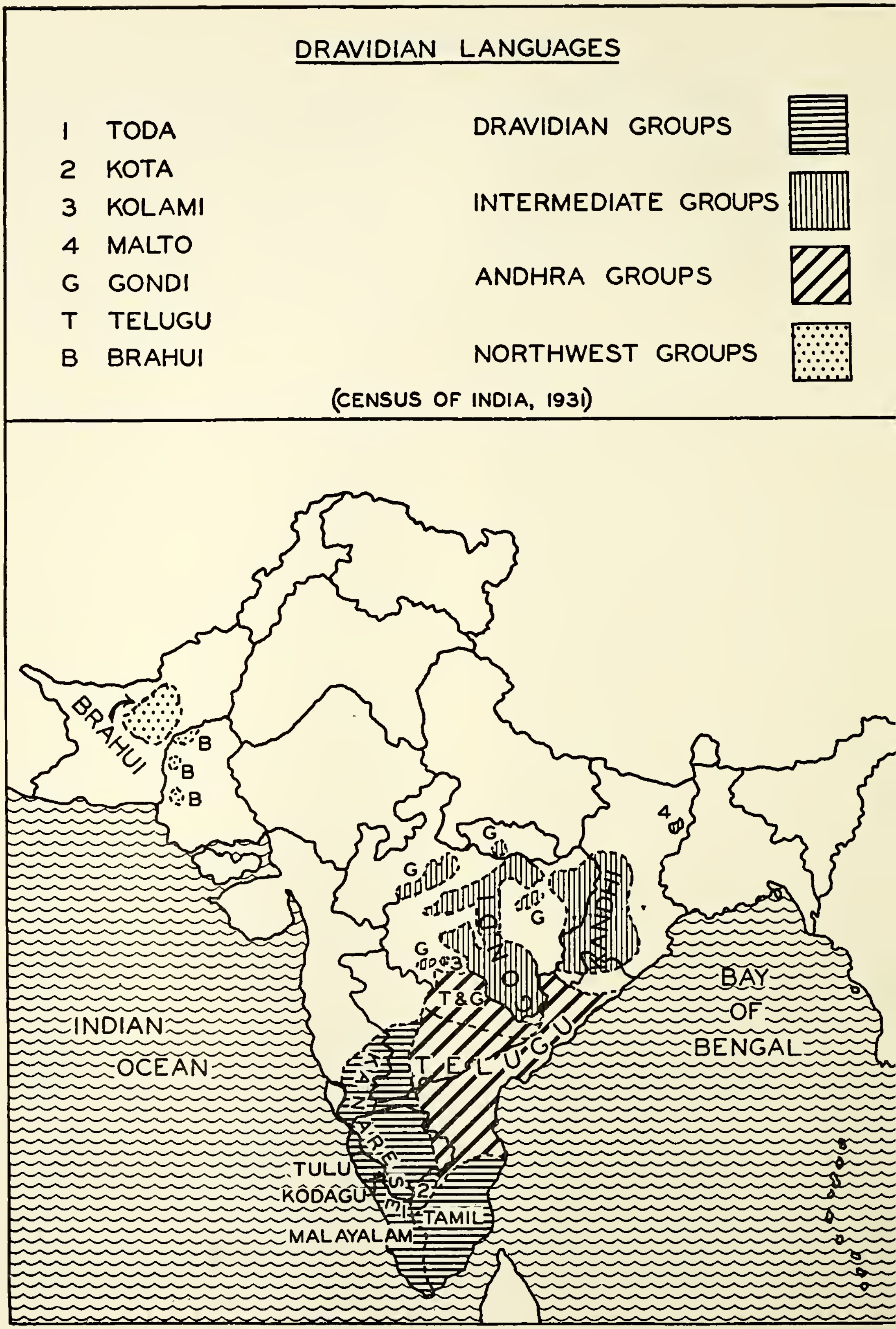

FIG. 11. Dravidian languages (*after* Census of India, 1931).

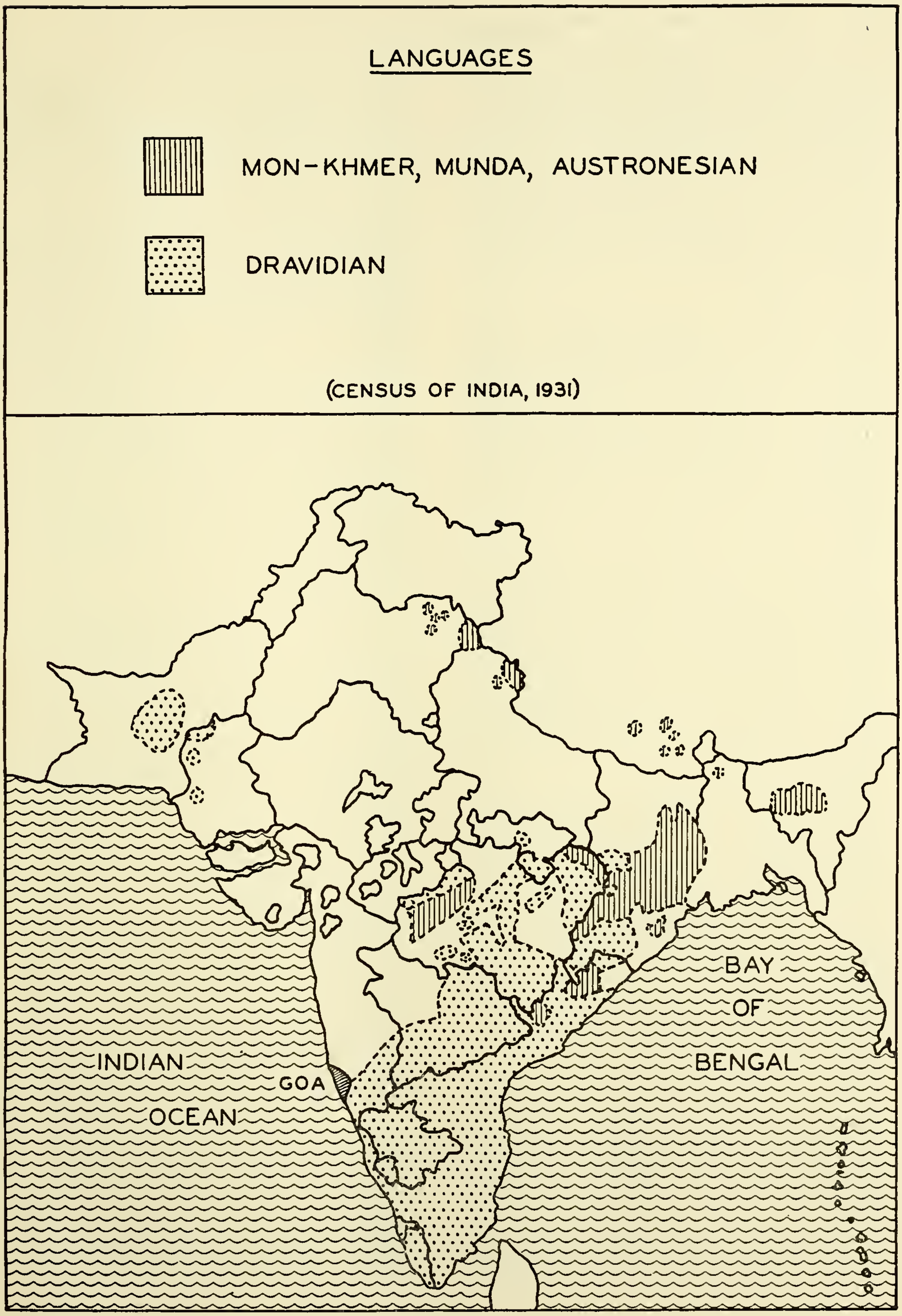

Fig. 12. Dravidian, Mon-Khmer, Munda and Austronesian languages (*after* Census of India, 1931).

pensation of the Mahdi"), it appears that this sect is of Indian origin and was founded by Muhammad of Danapur in Jaunpur, who is stated to have been an Afghan or a Saiad. Expelled thence he made his way to the Deccan where the Ruler was converted. On the outbreak of a religious rebellion, the Mahdi was again driven out and after many wanderings with his immediate followers through Gujarat and in the desert of Bikanir and Jaisalmer arrived in Sind.

He was again expelled from Tatta and thereupon made his way through the Sind Valley to Kandahar, where Shah Beg Arghun, son of Zunnun Beg Arghun, is said to have become his disciple. But the mullahs and the rabble rose against him and he was again driven away to Farrah in the Helmand Valley where the *Tardid-e-Mahdawiyat* alleges that he died. The Makran Zikris, however, allege that he disappeared from Farrah and after visiting Mecca, Medina, Aleppo and other parts of Syria made his way to Persia and through Lar (Laristan) to Kech where he took up his abode on the Koh-e-Murad, near Turbat. Here he preached his faith for 10 years and died after converting the entire country.

Such is the account given by the Zikri books and the earlier part of it corresponds with the history of Saiad Muhammad Jaunpuri given by Abul Fazl who wrote in *Ain-e-Akbari* (Jarrett, trans.), vol. 3, p. 373:

> Saiad Muhammad Jaunpuri was the son of Saiad Budha Uwaysi. He received instructions under many holy men learned in spiritual and secular knowledge. Carried away by extravagance he laid claim to be a Mahdi and many followers gathered round him and numerous miracles are ascribed to him. He is the founder of the Mahdawi sect. From Jaunpur he went to Gujarat and was much in favor with Sultan Mahmud the Great. The narrow-mindedness of the worldlings made India intolerable to him, and he resolved to pass into Persia, but died at Farrah and was there buried.

The death of the Saiad Muhammad Jaunpuri at Farrah took place in 1505. He was born about A.D. 1442. Attention is called to the fact that Abul Fazl's father, Sheikh Mubarak, had attached himself to the religious movement whose followers came to be known as *Mahdawis.*

Although the Zikris call themselves Moslems, their creed is full of superstitions and idolatrous beliefs, and the fact that they read the Koran appears to be the only link between them and orthodox Moslems. In all matters of practice, there is a radical difference between the Zikris and their Sunni co-religionists; indeed their views on the main doctrines of Islam are diametrically opposed.

The Zikri faith is a remnant of the Mahdawi movement, which assumed a definite shape in India at the end of the fifteenth century through the teaching of Saiad Muhammad. The story of the introduction of Mahdawi doctrines into Makran by Saiad Muhammad bears self-evident indications of improbability.

It is more likely to have been brought to the country by some of his numerous disciples, one of whom, e.g., Mian Abdulla Niazi, exercised so much influence in India. There appears indeed to have been some connection between the introduction of the new faith and the advent of the Buledai rule in Makran, for all local accounts agree that it obtained a footing synchronously with the Buledais if it was not actually brought by them.

No historical or traditional evidence is obtainable about the existence of the Zikri faith in Makran prior to the advent of the Buledais and it may be that the link is to be found in Bu-Said, the first Buledai ruler, whose original habitat is said to have been Garmsel in the Helmand Valley, close to Farrah, and whose date according to the historical data available was probably synchronous with that of Saiad Muhammad.

This faith flourished greatly during the time of the Buledais and soon spread throughout the country. The Buledais were ousted by Mulla Murad Gichki, who gave a great impetus to the Zikri religion about the beginning of the eighteenth century, and who has been canonized in the Zikri calendar.

Mulla Murad, who proceeded to introduce a more complete organization, is said to have ordained community of property. He also introduced certain innovations in imitation of orthodox Mohammedanism, choosing Koh-e-Murad near Turbat as the Kaaba of the Zikris for their annual pilgrimage. He also sank a well, known as *Chah-e-Zamzam*, in front of Turbat Fort.

However, the expansion of a form of belief so obnoxious to orthodox Sunnis attracted the attention of Mir Nasir Khan I of Kalat, and caused him to carry fire and sword into Makran.

The principal doctrines of the orthodox followers of the Zikri faith in Makran are:

1) Dispensation of the Prophet Mohammed has come to an end and he has been superseded by the Mahdi.

2) Mohammed's mission was to preach and spread the doctrine of the Koran in their literal sense, but that it remained for the Mahdi to put new constructions on their meaning and that the Mahdi was in fact the *Sahib-e-Tawil* of the Koran.

3) Prayer (*namaz*) is unnecessary; and that instead of *namaz* people should resort to *zikr*.

4) Ramadan need not be observed.

5) The recognized formula of the Moslem faith should be dropped and the formula, "*La ilaha illallah: Muhammad Mahdi Rasul-ullah*" should be adopted instead.

6) Instead of *zakat* at the rate of one-fortieth, *ushr* should be given at the rate of one-tenth.

7) The world and the goods of this world should be avoided.

Their religious observances take the form of *zikr* and *kishti*. *Zikr* consists of daily prayers at fixed intervals and *kishti* of religious services on specified dates. *Zikr* is repeated in two ways: *zikr-e-jali*, the formula spoken aloud and the *zikr-e-khafi* or formula repeated silently. These prayers are very numerous, and each *zikr* consists of about 10–12 lines. *Zikr* should be performed 6 times daily as follows:

1) The *zikr* of *la ilaha illallah*, a *zikr-e-khafi* to be repeated by everyone 13 times before early dawn at home. It may be noted that all *zikrs* begin with this formula.

2) *Gwar-bam* or the *zikr* of early dawn. The words are *subhana la-yarju*, a *zikr-e-jali*, spoken in a loud voice and finished with a prostration (*sijda*). After the prostration, the *zikr-e-khafi*, *la ilaha*, *hasbi-rabbi*, and *jallalah jallalah* are repeated. While the sun rises, another prostration is made.

3) *Nemroch-e-zikr*, the midday *zikr*. A *zikr-e-jali* when all the *zikrs* except *subhana la-yarju* are repeated. No prostration is made as that is peculiar to the *subhan* formula.

4) *Roch-zard-e-zikr*, the *zikr* of the yellowing day, i.e., a little before sunset. A *zikr-e-khafi* ending in the *subhan* formula, also said sotto voce with a prostration at sunset.

5) *Sar-shap-e-zikr*, the *zikr* for the beginning of night. A *zikr-e-jali* said at about 10 P.M. in which all the *zikrs* are repeated in a loud voice except *subhan*.

6) *Nem-hangam-e-zikr*, the midnight *zikr*. A *zikr-e-khafi* repeated by individuals. For the proper performance of this *zikr-la-ilaha* should be repeated 1,000 times, prostration being made after every 100 repetitions.

Dr. H. Cook (1860b) described the Zikris (Zikaris or Dai Mazhabis) as follows:

> They resemble the Brahuis in appearance and wear the same dress. As far as I could learn, also portions of certain Brahui tribes are Dais, such as the Segeta, Saki, Shadu Zai, Marbrao, and others. They have a mulla or priest, and a book. They say that they originally came from the westward near Kej, where there is a city called Turbat. The sect abounds in Makran, and has extended as far as this. At the village called Turbat is a little hill of circular form called by them Koh Murad, on the summit of which is their principal masjid, where they meet at stated times to perform their rites. Here they appear to have arisen as a religious class. Their prophet ages ago miraculously found in a tree, which they call "Barukahur," a book, in which was written that they were to curse all Mohammedans, and set up a fresh religion. Instead of repeating "God is God and Mohammed is his prophet," they exclaim in derision, "God is God, but the mother of Mohammed is his prophet." When a man marries a wife, the mulla has a right similar to that held by French seignors and English lords of the manor in the olden times: the woman is considered to be sanctified and cleansed by associating with the priest. They meet for religious purposes at midnight at some house previously appointed, women as well as men. The ceremony is commenced by reciting the names of their prophet as follows:
>
> "Hadi, Madi-Gedon Madi-Hadi a banazin, Madi a banazin, Surukra banazin." This is continued for some time, the fanatical excitement increasing until they throw themselves on the ground in a frenzy. After which they chant the following words—
>
> "Challar, Challar Ma likna, Vajanama yad kuni."
>
> This does not appear to tend to lessen their fanaticism, but on the contrary stirs them to madness. After a time they give vent to their insanity; they suddenly seize indiscriminately on the women, no matter in what relation those may stand to them, whether of sister, wife, mother, or daughter, and when morning breaks they separate and go to their respective homes. It is said that on the grand occasions of their assembling on the Mount Koh Murad they further debase themselves by imitating the an-

> tics and movements of various animals and by crawling on the ground and eating grass. It is not to be expected that the state of morals amongst such a class as this should stand very high, and it is said to be of the very lowest description. The sect appears to be known under the name of Zikari, at least as commonly as under that of Dai Mazhabi. Ross, who received the account from their chief mulla, says that the former name is derived from the word "Zikar," that is a "formula" which it is their custom to repeat instead of the regular Mohammedan prayers. Their prophet, the same authority informs us, is Mehdi, whom they prefer before Mohammed, and they may probably be identified with the Mehdi-ites of the Punjab. According to their chief mulla, the Zarkaris appeared as a new sect in the Punjab about A.D. 1591. At this period they consider that the Mohammedan dispensation came to an end, and the last and greatest prophet, Mehdi, appeared and established the new faith. The prayers in use were abolished in favour of the *Zikar,* which should be repeated three times a day. The prophet, who appeared at Attok, afterwards disappeared in some part of Makran, but is to be looked for in the latter days. This is another version of the Mohammedan account of Mehdi, whom the Shiahs hold to be alive, but concealed from human sight. The Zikaris are most numerous in eastern Makran. They are to be met with in Kej, Kolanch, and Kolwah.

At the siege of Kej, in the great Nasir Khan's reign, the defense was made by the Zikris. After many fruitless attempts the Kalat troops carried the place, killing or capturing all the defenders, and defiling the graves of their patron saints. The bones of the latter were exhumed and burnt with horse litter.

In 1955, the principal concentration of Zikris was in the Turbat area. We were informed that thousands of the faithful assembled at Koh-e-Murad for their annual pilgrimage.

Dehwars. That the *Dehwars* form the Tajik element of the population of Baluchistan, seems now to be established. Leach (1843) observed:

> I do not look upon them as a distinct race, but as descendants of the different lords of Kalat, who have, after being conquered, sunk down into tillers of land.

But directly after this he writes:

> The present race, like the other Tajiks of Khorassan, speak Persian, corrupted with the local neighboring dialects.

Latham emphatically refers the Dehwar to a Tajik origin, and gives the names under which the 4 great divisions are known: Tajik in Persia; Sart in Bukhara; Deggaun in Afghanistan; and Dehwar in Baluchistan.

Pottinger (1816, pp. 79–81, 271 and 273) writes:

> I had at one period of my inquiries on Baluchistan conceived the Dehwars to be a colony of Guebres, or ancient Persians, that had been forced to embrace the Mohammedan faith, and fled from their persecutors. But by more recent investigations I discover that the same people are to be recognized in many different parts of Asia by various names; that they all speak the same pure Persian; coincide in manners and occupations; and, what is even more remarkable, they all, as far as I know, live under the same restrictions and immunities as those of Baluchistan, which is of itself presumptive proof that they have been at one time refugees from another country, and allowed to settle on entering into a compact with the ruling authority.
>
> Among the Afghans there is a very extensive tribe, also well known in many parts of Asia, denominated Tajiks, whose characteristics are described as corresponding so minutely with those of the Dehwars that I can see no doubt of the ancestors of both having sprung from the same stock. The Tajiks are reputed inoffensive, industrious, and observant of their promises or agreements, devoted to husbandry and pasturage, and having their abode in villages of mud houses, that are by them called Dehs, and not Tumuns, which last is the usual term in Afghanistan. The Dehwars, or Dekhens, which words are synonymous and signify villagers, are the fourth and last class of those whom I have described as constituting the population of the city of Kalat. They are, like the others, not confined to it alone, and are to be recognized in different districts of the country under various names, which are ordinarily those of the places they inhabit. Thus, those of Mastung, Tiri, and Pringabad (villages north of Kalat) are not styled Dehwars but Mastungis, Tirichis, and Pringabadis. Of their origin I have been unable to discover any certain traces: their colloquial language is common, pure Persian, from which fact many assert that they are the descendants of those people who remained behind on Nadir Shah quitting Baluchistan in 1747. But, on the other hand, this is in a great measure confuted by our finding that a tribe answering to their description was known in that country long previous to the invasion of Hindustan by that Monarch. Their pursuits are agricultural, and those who reside in or near Kalat are bound to serve the Khan without pay; to provide water, fuel, grass, and grain for his guests, their retinue, and cattle; to attend the Khan himself on his hunting excursions in

> the neighborhood, and to furnish couriers *(kasids)* on all occasions when required on the public service. In return for this vassalage, they enjoy various immunities, of which the most advantageous and desirable are holding their lands free of rent or taxes, paying no tolls upon the produce on bringing it to market, being exempt from military service out of the immediate district of Kalat, and having the privilege of grazing their flocks on any part of it, except it be cultivated or enclosed.
>
> In manners and appearance the Dehwars are distinct from all the other natives of Baluchistan. Quiet and harmless in disposition, they seem happy to give a tacit acknowledgement to the superiority that both Baluchis and Brahuis, with whom they are not allowed to intermarry, arrogate to themselves over them, as though it were to prevent the possibility of disputes on that head.
>
> They reside in villages, as their name imports, consequently never migrate, but cultivate the soil in the vicinity of them, disposing of the products to the pastoral tribes and Hindus. Those who are removed to a distance from the capital pay a small portion also to the Chiefs under whose authority, or rather protection, they dwell. In stature and figure the Dehwars are below mediocrity. Nor are they in other respects at all a comely race: their blunt features, high cheek bones, and bluff cheeks, rather render them the reverse; but notwithstanding their want of good looks there is an artless, honest and good-humored expression in their countenances which is, perhaps, full as pleasing.
>
> They are civil and obliging to strangers, but devoid of that spirit of hospitality for which the Baluchis and Brahuis are so justly famed. Although they furnish no quota of troops when the Khan goes to battle, yet they are accounted so faithful and trustworthy that a detachment of them is always on guard over his palace at Kalat, and likewise at the city gates.
>
> They are Sunni Musalmans, and in religion and domestic habit so exactly coincide with the particulars already given of the Brahuis, that it would be useless to treat more in detail of those points.
>
> They ridicule the seclusion of women, adopted in most Muhammadan countries, as a barbarous and unfeeling custom, and their sentiments on this head, and their treatment of females, show them to be more enlightened than any of the followers of the Arabian Prophet I have ever conversed with.

The Dehwars appear to cling chiefly to the elevated province of Sarawan, and notably to the district and town of Kalat.

Lieutenant Robertson, who visited Kalat in 1841, offers the following classification of the tribe:

Sewazae	*Alizae*	*Moghaizae*
Rastak	Tingbazae	Kandharizae
Palwanzae	Chagozae	Palawanzae
Hasanzae	Moreshkazae	Baorazae
Harazae	Mangarzae	Saltozae
Tekarzae	Musazae	Badozae
Baorazae	Hasanzae	Rajabzae

Tolontizae	*Dodakkhanzae*
Bajazae	Pir-i-Panjgur
Kandharizae	Sumailzae
Gangozarzae	Tatuzae
Aghazae	Kabulizae
Mandaozae	Fatianzae
Yusufzae	Abdul Karimzae

Each grand division has a headman styled "Res," that of the Dodakkhanzae being Chief of the whole. There is also another person called the "Mirab," whose duty it is to apportion to the different fields of his own class their share of water.

Sangur. This large tribe, scattered from Persian (Iranian) Makran eastward to Las Bela, is strongest between the Basol and Rumbar rivers. Of Jadgal origin, they claim affinity with the Jokhias of Sind. According to their tradition, their earliest migrations took them from Sind toward Kalat, where they settled until driven into Makran, probably during the Brahui-Jadgal war of the fifteenth century. The Sangur are nomads, famous for their camel-breeding and flockowning. However, whenever opportunity occurs, they become settled cultivators, such as the Mehdizais near Gwadar, in Kolwa and other parts of the Kech Valley.

Shehzadas. This small group have headquarters in Jiwnri and a few families live in lower Dasht; some are in Baho-Nigwar in Persian (Iranian) Makran. They claim Afghan descent through Jamand, son of Khair-ud-Din, alias Kharshabun, son of Saraban, who came from the country of the Marwats in the Bannu District. The majority of the males in Jiwnri were annihilated by repeated Arab and Persian attacks. The Shehzadas, who claim the distinction of prefixing *Mir* to their name, occupy a social status equal to that of the Kalmatis and Kauhdais. In recent times many have left Jiwnri to settle in Pishukan near Gwadar.

Barrs. This powerful group in Panjgur trace their origin to Beduins from the Gulf of Oman. Their first settlements were west of

Mand in Peshkin Valley, where many still live and are known as Barr-e-Buledais because of their intermarriages with the latter. The majority are nomads, engaged in flockowning and camel-breeding. They also possess some dry-crop cultivation in Bunistan (Isai), Tasp, Garmakan and Chitkan.

Kashanis. Another powerful tribe in Panjgur, with headquarters at Dasht-e-Shahbanz, they are an offshoot of the Shahwanis of Iskalku near Kalat. Their name appears to be a corruption of Kishani, a large Shahwani clan. The Kashani are divided into Mastar Kashani, the leading family, and Hurt Kashani, the rest of the tribe. Their social status is similar to that of the Barrs. The Kashanis own flocks and camels and have developed some dry-crop cultivation in Shahbanz.

Mullazais. This important group in Panjgur has headquarters in Tasp. Tradition places their origin near Shiraz in Iran, some settling in Dizak, others in Panjgur. They are related to the Mullazais of Kalat. The Mullazais are large proprietors, owning irrigated lands, chiefly in Tasp.

Kenagizais. This small group lives in Isai. Jadgal by origin, they claim affinity with the Jamot tribe of Las Bela. Their arrival in Panjgur coincided with that of the Gichkis. The Kenagizais have gradually acquired irrigated property of Panjgur through intermarriage and purchase.

INFERIOR GROUPS

1) *Meds.* They live all along the coast of Makran and Las Bela, possess many of the characteristics attributed by Arrian to the Ichthyophagoi. From inscriptions at Gwadar, the nucleus of the Meds come from Gandava in Kachhi, an origin which corresponds with historical evidence. (Cf. Elliott [1869, vol. 1, p. 521], who refers to the connection of the Meds with Upper Sind.) For example, their patron saint is Sakhi Tangav, whose tomb is at Dadhar in Kachhi. During the centuries, the Meds have absorbed a large admixture of alien and Negro slave blood, the latter being obvious between Gwadar and Sonmiani in Las Bela, especially in Pasni. The Meds are divided into: the Meds proper, the fishermen; the Koras, the seafarers; and the Langas (= slaves), those of doubtful or slave extraction. This connection between the Meds and Koras appears to have been very ancient (*see* de Goeje, 1903).

The Meds are divided into: (*a*) Chilmarzai, the tribal leaders, who trace their origin from the Lumris, Numris or Numrias of Las Bela; (*b*) Jalarzai, who claim Baluchi (Baloch) descent; (*c*) Gazbur, also of Baluchi (Baloch) origin; and (*d*) the Ormari (loc. Olmari), who claim Afghan origin.

The Meds are above the average stature with broad heads, oval faces and noses distinguished by the length of the tip. Their skin is brownish and they have hazel eyes. They are strong, athletic and robust, capable of performing marvellous feats of strength and possessing great powers of endurance on the sea.

2) *Darzadas.* This group, one of the most numerous in Makran, live scattered throughout the country as well as along the coast. In Panjgur they are known as Nakibs; here they occupy the irrigated lands on both sides of the Rakhshan River. Their headquarters are in Kech between Sami and Nasirabad. The Darzadas of Kech are divided into: (*a*) the Bazaris, the section of the headman (*kauhda*); and (*b*) the remainder of the tribe. This section is wealthier than the Nakibs of Panjgur. Their chief occupation is agriculture, although some are shoemakers, potters and weavers.

The Darzadas are well-built, robust and muscular, with thick broad shoulders, low wide foreheads, short, thick and almost flat noses and large dark eyes. They are of medium size, and many of them show signs of African blood in the short curly hair and thick lips. Their skin is a dark copper color and not uncommonly quite black.

3) *Loris.* These gypsies, who are scattered throughout the country, may be divided into the settled and nomadic elements. The former include the Sarmastaris, the descendants of Sarmast, and the Zangishahis, who are believed to have accompanied the Gichki migration from India.

All Loris are either handicraftsmen, such as carpenters, blacksmiths and goldsmiths, or musicians and ballad-reciters. The latter seldom compose themselves, but sing the ballads of others, celebrating events of importance in verse.

Each group has a special name: a carpenter (*dar-trash*); a blacksmith (*asinkar*); a goldsmith (*zargar*); musicians (*dohli* = drummer); and ballad-reciters (*pahlawan*), who are considered the most respectable.

Wandering Loris practise jugglery, palmistry and fortunetelling. Their reputation for barter is proverbial. A Lori began the day with a donkey worth 5 rupees; by nightfall, after bartering 50 donkeys, he owned one worth 100 rupees. Known as rogues and vagabonds, the Loris perform certain menial duties on the occasion of circumcisions, marriages and deaths.

At weddings, they shave, wash and clothe the bridegroom, beat drums and play musical instruments. They also cook for the guests. Certain Lori women, called *mashshata*, wait on the bride and attend the female guests. Every guest must give each Lori a present.

At funeral feasts the Loris are forbidden to wash the guests' hands; this must be done by a person equal in social status to that of the deceased. The Baluchis enforce this ritual.

In their spare build and low stature, irregular features, dark eyes and complexion, coarse black hair and timidity of nature, the Loris resemble the Dravidian peoples of India.

4) *Servile Dependents.* They must work for food and lodging, but may retain their independent earnings. The slaves from whom they are descended are believed to have come from southeast Arabia. Others are descendants of Baluchis sold or bartered as the result of intertribal warfare.

5) *Khojas or Lotias.* With headquarters in Gwadar, they have migrated to Pasni and Isai in Panjgur. They settled in Gwadar about 7 generations ago, their home being Cutch Mandavi in the Bombay Presidency. They acknowledge the authority of the Agha Khan, who is represented by a local *mukhi.* They are in the wholesale business, dealing in fish, matting, cotton and wool, which they export in exchange for piece goods and food.

Chapter IV

THE BALUCHIS

THE population may be divided into 5 classes by occupation: landowners, cultivators, flockowners, seafarers and fishermen, and artisans. The landowners are the least numerous class and consist of the dominant races and the more prosperous families. They include the Gichkis, Nausherwanis, Mirwaris, Bizanjaus, Rinds, Hots, Rais, Lundis, Kattawars, Kenagizais and Mullazais. Their lands are cultivated by tenants or hired labor. The dominant classes collect revenue from their lands, in addition to the proprietor's share of the produce.

Occupations

With the exception of the shepherds, the Makranis lead an idle, easygoing existence. A universal characteristic is the midday sleep, which everyone enjoys for about 3 hours from noon, be he chief, cultivator or flockowner. Another feature of the social life consists in the daily meeting (*diwan*) held morning and evening by the headmen of each community.

A chief or headman rises early and, after offering his prayers, takes breakfast (*harzband*). On emerging from his house, he takes his seat under the shade of the tree which, by ancient custom, has come to be regarded as the meeting place of the village and here he is joined by other idlers until by 10 o'clock a fairly large gathering has assembled.

The weather, crops, local politics, old fights and other subjects are discussed until noon when everyone retires for his siesta, after which another meal is taken and *diwan* is again held until the call to evening prayer. Now and then a visit is made to the fields to see how the crops progress. The household work is done by girls of servile origin and the cultivation by tenants or servile dependents.

The cultivator is busy only at seedtime and harvest, especially in large *khushkaba* tracts where no weeding is done. The interval is spent like the chiefs and headmen. A cultivator who owns irrigated lands attends to his fields daily, does weeding when necessary, and looks to the repair of his fences. However, the cultivator is not idle even when he attends the village meetings, for, while listening or talking, his hands are busy in spinning goat's-hair or wool or making palm-leaf sandals or mats.

The shepherd's life is spent in one monotonous round. He leaves the village before dawn with his flock to wander over hill and dale. When the pasture near the village is exhausted, he is sometimes absent from the village or encampment for weeks or months, merely returning to replenish his supply of dates, which he supplements largely with milk from his animals. A shepherd will sometimes eat dates at every meal for weeks at a time. He sleeps in the midst of his flock or in some cave or hole close-by, and is ever on the watch against the attacks of wild animals. His only relaxation is playing his reed pipe (*nal*).

The flockowners consist of the Koh-Baloch, who are included in the following of the Nausherwanis; the Sami Baloch included in the following of the Gichkis; the Kosag, Lagor, Gurgnari, Sajdi and the majority of the Sangur.

The women are hard-working and hard-worked. They possess a cheerful temperament and make good mothers. They occupy an extremely independent position. Excluding women of the dominant classes and of the more prosperous families, those of the poor and nomad groups, the Darzadas, Nakibs, Meds, Loris and servile dependents are, generally, of lax morals. They have few amusements except singing, and spend the day in household work, the care of their children, or in sewing and embroidery.

In former times the Baluchis kept many slaves, the fruits of their raids. The captives were blindfolded, tied on camels, and thus transported to prevent them from knowing how to return. The women's hair and men's beards were shaved and the roots destroyed by quicklime to deter them from wishing to return home.

The seamen and fishermen are divided into two classes known as the Koras or Langas, and the Meds. The former are said to have derived their origin from freed or unfreed slaves of the Kalmatis, who, in former days, employed them in their piratical enterprises in the Arabian Sea. These Koras are enterprising sailors, making their way in native crafts to Basra in the Persian Gulf and sometimes as far afield as Colombo in Ceylon and Zanzibar on the African coast. The Meds follow their occupation of fishing in close proximity to their homes, except in winter when they go to Gazdan near Pasni.

The boats employed are:

a) *Mahi-kush batel* is used for large fish (*kirr*), carries up to 100 bags and is beached during the monsoon.

b) *Batel,* smaller than (*a*), is used for fishing and in carrying coastwise cargo.

c) *Yakdar,* made on the Malabar coast from a single trunk. For local use, a keel is attached and the gunwale heightened. Fitted with sails, it can also be rowed. The crew consists of 3 men or 2 men and a boy.

d) *Hori,* a small rowboat or canoe, is built like (*c*) but possesses no sails.

The fish and fisheaters of the Makran coast drew the attention of the early writers. Alexander's troops encountered the *Ichthyophagoi,* who were succeeded by the Meds and Koras.

The best fishing grounds are off Kalmat, Gazdan, Sur, Drabbelo, Gwadar, Pishukan, Jiwnri, Pasni and Ormara.

Nets are in general use. Hook and line, occasionally the harpoon, are also employed. Fishing takes place at night, except for *kirr* and sardines.

The net (*arsi*), used for sharks, measures 480 feet long and 24 feet deep. The mesh is 8–12 inches square. For *kirr* the net (*jorau*) consists of a large seine (*mahor*) made by joining 10–14 smaller nets, each 100 x 50 feet. The coarse string makes each mesh 4 inches square. As an auxiliary, a square net (*jal*) is used to remove the fish from the seine. A third net for *kirr* and fairly large sharks is the *rebi* (180 x 18 feet).

Other nets include the *riju, rach* and *rug,* the last a weighted circular casting net (10–15 feet) for sardines.

The nets are made either of cotton, hemp or flax. Cotton thread (*bandik*) and hemp are imported from Karachi.

In making cotton nets, each skein is rolled into balls. From 2–4 threads are then spun together and twisted into the string, which is soaked in water and stretched to remove kinks. A good worker finishes a wide-meshed net in several days. Men and women complete a net (75 x 12 feet) in about 14 days. The net is soaked in water, then kept stretched to tighten the knots, and finally limed.

For liming, the net, after being washed in fresh water, is placed, while still wet, in an iron pan containing milk of lime which is kept boiling constantly for 3 days, water being added as required. Cotton nets cannot be set in water for more than 3 days continuously. The lime is made from shells, which are collected in small heaps, covered with wood, fired and allowed to burn down. The ashes are piled into small dwarf-palm (*pish*) baskets, which are placed in sea water to slake.

All nets are used with cedar floats (*bhai*). Date-wood ends are sometimes used, but they sink when waterlogged. Dried gourds also make useful floats.

Sharks are caught in nets or with hook and line. Large sharks are caught on *paghas kundi;* smaller ones, *kirr* and other big fish on *rada kundi;* and small fish on *chirdani kundi.* The hooks are made locally. Fishing lines are waterproofed annually with a paste made of pods of *gishtar* (*Leptadenia spartum*). Small live fish (*kabloshk* and *tantar*) are used as bait. When the shark is brought near the boat, it is speared and a mug of fresh water is poured down its throat to hasten its end. Large sharks are brought ashore by tilting a boat with the aid of another until it sinks low enough for the shark to be pulled over it; the water is then bailed out and the boat rowed toward shore.

At the beginning of this century, air bladders were sold to England for the manufacture of isinglass. These were obtained from: *kirr* or *swach* (*Sciaena diacanthus*) 3 feet long and 18 inches wide; *mushko* or *mushka* (*Sciaena* sp.), 12 inches long and 3 inches wide; and *gallo* or *galla* (*Siluridae* sp.), the catfish, 18–24 inches long, whose young are called *khaggi* and *dubar.*

Sharks' fins were shipped to China. The sharks (*paghar*) belong to the genus *Carcharias* and range from 6–18 feet. During the monsoon, the best fishing is about 40 miles south of Ormara. Oil, extracted from the liver, is used for oiling the woodwork of boats. At Ormara, white fins (*ranja*) are sold for double the price of the black-tipped (*mangar*).

Sardines (*lujar* or *lijar*), abundant from June–September, are consumed locally or are used as bait. Many fish are salted after the bladders have been extracted.

Nomadism

The tendency to nomadism throughout Makran is not as pronounced as in some other parts of Baluchistan. The nomadic population is large; it is estimated roughly to represent nearly half the population, but it is divided sharply into two groups. The first of these contains those groups who habitually wander over the country throughout the year, the chief of which are the Sangur, Bizanjau, Kil Kaur Baloch and Rakhshani. The other group moves in a much more limited circle, pasturing its flocks and herds of camels throughout the spring and summer in the hills, but returning to the neighborhood of the permanent villages in the winter. Such are the nomadic sections of Kulanch, Dasht and Nigwar, consisting chiefly of Sardashtis, Bands, Puzhes, Jadgals, and Lattis. In addition to pasturing their flocks, these people are engaged chiefly in the transport business to supplement their means of livelihood, which is otherwise scanty and precarious.

Internal periodic migration takes place during the date harvest when the entire countryside flocks to Kech and Panjgur, the principal date-growing areas. In the spring a system known as *Bahar chareni* is in vogue, when many of the permanent inhabitants of the villages are seen wandering in the hills in search of fresh pasture for their flocks and herds and change of air and scene for themselves.

Dwellings

In former times, the Baluchis were forced to live together in or around small mud forts, square or elliptical, with walls thickened at the bases and 30–40 feet in height. Bastions were located at each corner some 7 feet higher than the walls. A square tower in the center of one of the side walls commanded the area. The water supply was from wells either in the interior square or in a bastion.

In the larger villages, especially in Turbat and Panjgur, owing to the cold, many of the houses are made of mud, but the poorer classes retain the mat hut which is sometimes lined with mud. In former days, the habitations were always constructed clustering round the forts of the headmen, and no one was allowed to live in anything but a mat hut, which could be easily removed in time of danger. However, the introduction of greater security resulted in the erection by well-to-do persons of many buildings of sun-dried bricks. These houses consist of a single story with a flat roof and containing 2 or 3 rooms. No verandah is built, but a large open space in front of the house is enclosed by a mud wall or an ordinary fence.

The nomadic population lives in tents (sing. *gidam* or *ghedan*), generally made of matting stretched on poles for summer and of goat's-hair blanketing for winter. The latter are more numerous in northern than in southern Makran, where the dwellings of the settled population generally consist of mats, black felt or coarse blankets stretched over a wickerwork frame formed from the branches of the tamarisk (*guz*) bush and lined with grass and dwarf-palm (*pish*) leaves.

Most of the roofs of the mat huts are pointed at the summit (*kargin*), but others are elliptical (*har-pusht*) or dome-shaped (*tuppu*), the latter being especially noticeable in Mand. In front of the dwelling is a big yard with a mat or date-palm fence. The matting of the hut is rainproof and so strong that it lasts for 50–60 years, and the Baluchis state that a bullet from a matchlock cannot pierce it.

An assemblage of tents constitutes a village (*tuman*) and the inhabitants a society or clan (*kheil*).

When a visitor arrives at a *tuman,* a carpet is spread in front of the door of the guest house (*mihman khana*), of which there is one in every village or town in Baluchistan. The Sirdar, or head of the Kheil, welcomes the visitor.

Dress

The Baluchi wears a coarse white or blue calico shirt open about 14 inches down the front, buttoning around the neck and reaching below the knees. Their trousers are of the same cloth, or a striped material, called *susi,* and puckered around the ankles. On their heads they seldom wear anything except a small silk or cotton quilted cap which is made to fit the shape of the skull. Over this, when in full dress, they add a turban, either checked or blue, and a colored sash (Ar. and Pers. *kamarband*) around their waists. In cool weather they wrap a scarf (*lungi*) around the throat. On their feet they wear home-made sandals (*sowas*) woven from the dwarf palm (*pish*). Shepherds carry a branch which serves as flyswatter and sandal repair kit. Landowners wear shoes.

The Chiefs and their relatives appear in winter with a chintz tunic (*ulkhalig*), lined and stuffed with cotton. The poorer classes wrap themselves up in a long outer garment made of a peculiar kind of cloth manufactured from a mixture of goat's-hair and sheep's wool.

A landholder wears a muslin turban about 10 yards long and of double width, sometimes tied over an Afghan peaked cap (*kulla*); a short shirt reaching to the knees and made of 5 yards of white long-cloth buttoning on the right shoulder; and baggy trousers made of 3½ yards of the same cloth, which is sometimes dyed black or blue. To the above is added a wrapper (*chadar*) of thick sheeting, double width for winter wear, and of single sheeting for summer wear.

A flockowner or tenant wears a shirt and trousers and, in winter, a small turban tied around a small, round, embroidered cap with a wrapper; all are made of cotton. A thinly woven overcoat of dark wool (*shal*), sometimes profusely embroidered, which lasts for many years, is worn as a protection from rain or cold.

A herdsman or servile dependent possesses only trousers, a small piece of red cloth for tying up his hair, and a wrapper (*chadar*), used as a towel, waistband or headdress and for tying things to be carried. He wears his hair long, but some Makranis cut it short over the nape of the neck.

The women's attire is very similar to that of the men. A long cotton shirt (*pashk*), dyed red or brown, reaches to the ankles. Their trousers are wide and made of silk or a cotton mixture. This silk, called *kanawez,* was manufactured in or near Meshed, Ghazni, Herat or Bukhara.

The headcloth (*chadar*) is protected from becoming soiled by a short, silken scarf (*gushan*), which is tied over the hair. The shifts and wrappers of the more prosperous are made of silk; the former are profusely embroidered in front. Among the poorer people, a single silken shift is given by the bridegroom to the bride at the time of marriage, and for ordinary use she has a shift without embroidery, generally made of red or blue cotton cloth or of spotted or variegated chintz. One shift and wrapper will carry her through a number of years. The old women tie handkerchiefs around their heads, flowered with worsted or silk.

The young women, both married and unmarried, have an ingenious method of arranging their hair. It is divided by a parting which reaches from the forehead to the nape of the neck and is then made to bunch in horns on the top and at the side of the head. Afterward it is woven into two plaits which are joined at the back. The higher the horns (*mut* or *shah*), the more fashionable is the possessor. A profusion of hair is considered a mark of beauty among all the Baluchis.

The commonest description of ornaments in use are nose-rings and earrings, but others are also worn in accordance with family wealth. Young girls wear silver ornaments (*chotil*) to join the two plaits (fig. 62). Girls belonging to wealthy families wear elaborate golden or silver necklaces, breastplates, bracelets and anklets (figs. 63–66).

Food

Four meals are eaten daily by the majority: breakfast (*harzband*); lunch (*nahari* or *subarag*); the afternoon meal (*nemrozai*); and dinner (*sham*). Breakfast is taken immediately after rising; lunch at about midday; the afternoon meal between 3 and 4 P.M.; and dinner after sunset. For the afternoon meal, which is a light one, everyone consumes dates. Breakfast and lunch usually consist of dates washed down with water or milk; for dinner *juari* cakes are eaten.

These various foods are wheat and barley cakes, rice, dates, cheese, sweet and sour milk, soup made from peas (*dhall*) and seasoned with red peppers and other spices, and any kind of meat, including all kinds of game and young camels. Among vegetables, they prize onions, garlic, and the leaves and stalk of the asafoetida (*Ferula narthex* Boiss.), which they roast or stew in butter, raw or clarified.

Boiled fish is enjoyed by everyone whenever obtainable, the gravy being sipped with the dates and the flesh being eaten at the end of the meal. The poor seldom see meat of any kind. Among the wealthy, the use of rice for breakfast is common, and wheat cakes are substituted for the date ration at lunch and dinner. A man of substance will also eat meat frequently with all 3 meals, but he has a special preference for fish.

The extensive consumption of dates has been indicated above. They may be regarded as the staple food of the population. It is not uncommon for a hard-worked Zangi or Baddi to consume 2 seers at a sitting, and stories are told of men who have eaten 5 or 6 seers at a time. Dates are considered the choicest kind of food and very invigorating, and a supply of them is the only provision taken for a journey.

A taste for dates and fish is quickly acquired by strangers, and the subject forms a standing joke about the Brahuis among the indigenous population. When a Brahui first comes to Makran, he is said to turn up his nose at both, but after a few days he sticks fish in his turban and carries dates in the folds of his trousers.

Juari or *juwari* (locally known as *zurrat*) comes next in importance to dates as a food. The flour is ground by the women in handmills and made into a thick paste with water. It is then baked on a stone griddle. The same process is followed with rice, which is of poor quality, and consequently seldom boiled whole. The consumption of wheat flour is small and the cakes made from it are generally eaten unleavened everywhere except in Panjgur. A Makrani prefers his dried fish boiled but has no objection to eating it raw—a habit which is attributed to the Ichthyophagoi by Arrian. The meat of fowls is that most commonly eaten, but rich men kill goats and sheep occasionally for the entertainment of their guests.

The well-to-do keep cows, but the majority of the people depend for their supply of milk on goats and sheep. The milk is generally taken raw or as curd, which is prepared with a piece of copper or silver, alum, *paner-band* (*Withania coagulans* Dun.), or rennet extracted from the stomach of a kid. Butter is made from curd in a churn made from a leather skin (*hinzak*); cheese, by extracting the moisture from the curd. Whey is boiled, and the residue, after evaporation, made into *shilanch*. The biltong, which is so common in the upper highlands, is known in Makran as *tabaig*, and is seldom made except by the wealthier people of Panjgur.

The condiments consist mainly of turmeric, the seed of the sour pomegranate, tamarind, and pepper. With the exception of the tamarind, the others are pounded, made into cakes and dried for ready use in stews, to which ghee is sometimes added. With the exception of onions, which are generally eaten raw, the garden vegetables common in northern India and the eastern regions of West Pakistan are practically unknown. However, the poorer Baluchis are fond of vegetable stews made from beans (*bank lenk*) and pulse (*masur*). In Panjgur, turnips boiled with dates are regarded as a great luxury. Among wild plants eaten as vegetables may be mentioned: *sorichk* which grows chiefly along the coast; *shagoshag* which is very popular; *aputag* which grows after rain at the foot of the dwarf palm (*pish*) and is consumed in large quantities; *indar-kah* (*Trianthema pentandra*), which is eaten only by the poor in case of great necessity; and *gurag-pad* (*Malva parviflora*), which grows in abundance in places reached by the river floods. The last is eaten only when nothing better is procurable.

MANUFACTURES

The staple commodity of the country is wool which, in the neighborhood of Wad and generally in the southern parts of Baluchistan, is produced of a quality so superior as to have attracted the attention of Quetta and Karachi merchants.

The manufactures are scarcely worthy of

notice, excepting for carpets which are somewhat similar to the Persian, and the coarse description of blanket made from equal parts of goat's-hair and sheep's wool, which is used for tents (or *ghedans*) to the north of Khuzdar. South and west of that place, tents are generally made of dwarf-palm and date-palm leaf matting.

Embroidery and needlework, either in silk, gold, or silver, is in considerable repute; but this manufacture is invariably carried on by the women, who employ much of their time in making up their own or their husbands' clothing.

Owing to poverty, the import trade is insignificant. Cotton cloths from India, woolens and furs from Afghanistan, and firearms, swords and shields from India, Afghanistan and Persia, together with iron and gunpowder, formed the bulk of this trade. The exports consist of wool, matting, dates and fish, and the entire trade used to be in the hands of the Hindus and Khojas, so that the simple pastoral tribes derived but small profit from the produce of their flocks, soil and waters.

HANDICRAFTS

Cotton weaving was a prominent industry until European cloth was introduced. The weaver (*jola*) worked on daily wages, the raw material being supplied by his employer. Eight kinds of cotton and silk are woven:

a) *Man-o-bas,* a tartan in dark or light green or red squares, is generally used as a headcloth by both men and women. The pieces are woven (6 x 2 feet), 3 joined for a man and 2 for a woman.

b) *Gushan,* half silk and cotton (3½ x 2 feet), is tied by women over the front part of the head under the headcloth. These are often of dark green crepe with a red border.

c) *Sohren gulbadan* is made in silk or cotton pieces (36 feet x 16 inches). The material is scarlet with thin yellow lines. This material is used for shirts and trousers among all classes of women and men of lower ranks.

d) *Shunzen gulbadan* is a green cotton cloth with a thin red stripe of the same size as (*c*).

e) *Nem shahi* is plain red cloth made in the same lengths and used for the same purposes as (*c*).

f) *Hukub,* woven in silk pieces (6 x 2 feet), is used principally for women's shirts.

g) *Nest-man-jahan* is a spotted red silk cloth used for women's shirts.

h) *Bist-dasti,* cotton cloth (30 feet x 16 inches), is used by the poorer people.

Rugs. A few rugs are woven by Baluchi women in the *dari* stitch. Overcoats (*shal*) are also made; a thicker fabric is used for heavier overcoats (*duppi*).

Leatherwork. The commonest articles are saddlery, shoes for men and women, and sword belts with their accessories, such as pouches and bags for bullets and gunpowder. The leather is imperfectly tanned; dates, tamarisk and pomegranate bark are employed.

Embroidery. A great variety of patterns is worked, and almost everyone wears some embroidered garment. The front pockets and sleeves of the loose, shirtlike undergarment worn by the women and girls and called *pashk,* as well as caps and coats, are embroidered. Some of the needlework is very fine.

Pottery. The handmade vessels are long-necked earthen jars, round pitchers, cooking pots and date jars (sing. *humb*).

Woodwork. Carpenters (*dar-tarash*) make plows, grain measures (*kail*) of tamarisk or *kahur* wood, bedsteads, door frames, planks and boards.

GAMES

Indoor games, which are numerous, include one called *chauk,* known in India as *chaupat* or *chausar,* which has been introduced from Sind. It is played by 4 persons on a cloth worked in squares and with wooden men. The moves are regulated by 6 or 7 cowries which are thrown on the ground together as dice. Other people, who have never been out of the country, prefer a more homely game called *hashtan chauki,* which is played by men on a system somewhat similar to that of draughts, knucklebones being used as the dice. Boys are fond of playing knucklebones. The Meds of the coast all play the games of cards which are common in India without stakes, except on the occasions of the *Id-uz-Zuha* and *Id-ul-Fitr,* when men, women, boys and girls all play for stakes. This has been prohibited.

Ji, a kind of prisoner's base, is the most popular of outdoor games, and regular matches are arranged and played by the young men and boys of the villages in the evenings or on moonlight nights. Wrestling and racing are also favorite pastimes among the lower orders. The Meds hold boat and swimming races. Coursing and shooting are in vogue among the dominant races, but the Baluchis excel them in skill at both these pursuits. The Meds are the best wrestlers and excel even the Darzadas in feats of personal strength.

Pastimes

As among the Beduins of Arabia and the Bakhtiaris of Luristan in Iran, and many peoples from the Nile to the Indus, the Baluchis spend the greater part of their time talking and smoking. Many smoke or chew opium, others chew *bhang* (*Cannabis sativa*).

Poetry

The hereditary bards and minstrels (*doms* or *dombs*) are attached to many Baluchi tribes or families. Originally from Northwest India, they sing ballads from the ancient poetic lore. Few of these minstrels compose poetry; they prefer to memorize poems and ballads from their oral tradition. Among themselves they speak a Sindi or western Punjabi dialect, but they are equally familiar with Persian or Pashto, Baluchi or Brahui, according to their location.

Baluchi poetry is simple and direct in expression. The principal subjects are the vivid descriptions of the results produced by precious rain in a parched land. Battle scenes, with great emphasis on the hero, form another important category.

The poems may be further classified into: (*a*) heroic or epic ballads; (*b*) more recent war ballads; (*c*) romantic ballads; (*d*) love songs and lyrics; (*e*) religious and didactic poems; and (*f*) short poems, lullabies and rhymed riddles (*see* Dames, 1907).

Music

Professional minstrels are usually accompanied by 3 musical instruments:

a) *Dambiro*, a long-stemmed stringed instrument with a pear-shaped, wooden body, similar to a mandolin, but cut from a single piece of wood, with the exception of the flat surface. The 4 strings of sheep's gut (*roth*) are played like a guitar. The word *dambiro* is linked to the Persian *tambur* and *dambara* and to the Sindi *damburo*. Through the Persian forms there is a link to the tambours and tambourines of Europe.

b) *Sarinda* or *sarindo* (fig. 61), a short instrument with a wooden body covered with parchment on which the bridge rests, and a stem curved back in a right angle as in the ancient lute. The 5 gut strings are strung over the bridge and 5 sympathetic wire strings underneath (through holes in the bridge). The *sarinda,* held upright like a violoncello and played with a horsehair bow, is made of the tough, elastic reddish-brown wood of *Grewia vestita* or *G. oppositifolia,* called *shagh* in Baluchi. For this reason, this instrument is often called *shagh* in poetry. The *sarinda* resembles the Indian *sarangi,* but is shorter and broader. This name seems to be related to the Persian *sirinj.*

c) The pipe or flute (*nar*) is made of wood either 18 or 30 inches long, bound with strips of raw gut (figs. 59–60). This instrument, always played by a Baluchi, usually accompanies a short poem (*dastanagh*), the length being determined by the strength of the singer's lungs. The singer takes a deep breath, sings as long as he can, and ends with a gasp. If the poem consists of only a few lines, the singer repeats them until he is out of breath. The subject of the *dastanagh* is generally love, but some eulogize a famous raid or victory.

Marriage

Marriage (*sur*) takes place after both parties have attained puberty. Among the well-to-do, the bridegroom is generally about 20, while among the poorer classes he is usually older. The bride is ordinarily about 4 years younger. In very rare cases, infant betrothals take place, customarily among very near relations. The wealthy are the only persons who can afford to pay the dower for a second wife.

When a man's parents wish him to marry, they make their selection, and if the preliminary overtures are well received, they then dispatch an elder Saiad or near relation, such as an uncle or elder brother, to the father of the girl to arrange the betrothal (*zamati*). The future bridegroom's wishes are either not consulted at all, or, if consulted, are entirely subordinated to those of his parents. The bride has nothing to say in the matter. If the father of the bride consents to the proposed union, the amount of dowry (*labb*) is fixed and also the date of the wedding. This ceremony, which is known as *chakkana*, is considered binding but not so as to render retreat entirely impossible. It is considered a want of good breeding on the man's part to retreat without a plausible excuse, and anyone who does so is regarded with contempt. In the case of the woman, the betrothal is considered binding, except under special circumstances, such as adultery on her part or strong suspicion of it. In such a case, the dowry or, at any rate, part of it, such as the ornaments, is returned and the other expenses incurred by the bridegroom are recouped.

The payment of bride-price in vogue in other parts of Baluchistan does not extend to Makran, but every tribe possesses a recognized amount of dowry (*labb*) which consists of property (*miras*), ornaments (*sohr*), and servants (*bandag*). This dower becomes the sole property of the bride and is generally "prompt," but part of it may also be deferred. In addition to the dowry, the bridegroom (*zamat*) must present dresses (*pardach*) to the bride and sheep and grain to her father for the entertainment of the wedding guests.

All these preliminaries having been settled, the marriage (*sur*) is solemnized on the date fixed in accordance with the usual Mohammedan rites, and the bridegroom lives for some days, months or even years with the parents of the bride (*dishtar*).

The word *labb*, used in Brahui or Eastern Baluchi, means bride-price, but it does not convey this meaning in Makran. In other parts of Baluchistan, the money paid as bride-price is given in cash and is appropriated by the father or other guardian of the bride. In Makran, however, the *labb* (or *jahaz*) is paid in landed property, ornaments or servants and forms the personal property of the bride and she has every right of disposal.

Another payment is the bow-price (*kaman-baha*), a present made by the bridegroom to the brother of the bride or to her first cousin, which generally takes the form of a horse, rifle, sword or some other weapon. Cash payments are also substituted nowadays, the Gichkis giving from Rs. 600–1,000 and the more prosperous Baluchis from Rs. 300–500. A herdsman's bow-price is generally a camel or 3–4 sheep. The idea prevails throughout western Baluchistan that the bestowal of a daughter in marriage is humiliating in itself and, so far as can be gathered, this feeling appears to afford the basis for this curious custom of bow-price, the payment of *kaman-baha* being a kind of compensation for the gift of a bride and intended to symbolize the laying down of arms by the bridegroom before the bride's family and the recognition of their social superiority.

The Gichkis of Panjgur pay 15 male and 15 female servile dependents or, instead, for each servant 10 date trees or a plot of land which takes 25 seers of seed (*tuhmja*). To these are added 30 *sohr* in cash or ornaments and 3 silk and 3 cotton dresses. These rates obtain for endogamous marriages, but if a Panjgur Gichki gives his daughter to a Nausherwani, Mirwari or Mohammed Hasni, he demands 40 servile dependents and 40 *sohr*.

The Rinds of Mand, who are the fire-eaters of Makran and very punctilious about points of honor, lay much stress on the demand for *kaman-baha*, and the notion extends to other primitive Baluchis of the valleys. The Baluchis of Kech proper, however, are inclined to hold it in contempt.

With the object of obtaining the large amount of *labb* which has to be paid for his bride, it is usual for a Baluchi bridegroom to go himself or to send his father or uncle to his fellow tribesmen, relatives and friends and even to strangers to collect subscriptions. This custom is known as *bijjar* and everyone who is asked gives according to his means; one presents a sheep or two, another a camel, a third some weapon and a fourth cash. It is not considered respectable to refuse. The Chiefs of the country are now inclined to demand *bijjar* as a right and make the round of their people, realizing as much as they can but never less than Rs. 5 from an ordinary family and more from those that are richer.

Divorce is common among the lower classes of Baluchis. Both husband and wife possess the right to divorce.

Makrani women, therefore, have an important position in the community—far stronger than in other parts of Baluchistan.

RELIGION

The Makrani Baluchi belongs to the Sunnis of the Hanifite division and is usually remarkably observant of the forms prescribed by his religion. There are also unorthodox Moslem sects, such as the Zikris, Rifais and Khwajahs (Khojas or Lotias). The Arabs in the following of the Wali of Gwadar belong to the Biazi sect which flourishes across the Gulf of Oman in Muscat.

The introduction of Mohammedanism took place not later than the invasion of Mohammed bin Kasim during the eighth century. However, some groups reverted to heretical observances. Ibn Haukal (tenth century) mentions Rasak in Persian (Iranian) Makran as being inhabited by "schismatics"—probably Karmatian heretics; this was suggested by Elliott (1867, vol. 1, p. 459, note).

Three centuries later, Marco Polo remarks that some of the people were idolators, but the majority were Saracens. Later, the Shiah influence infiltrated Makran, for the ruling family of Maliks belonged to this religious sect.

In addition to professing Islam, nearly all Makranis observe the rites of such institutions known as *rifa* (*maulud* or *sima*), *shepar-ja* and *gwat*. The Rifais, who are the most numerous, were referred to as the "Exalted" or the "Face-slashers" for they struck at the cheeks or eyes of those who were slow to give them money. They are Sunnis, begging in the name of Allah, often under the influence of drugs, more rarely liquor.

The *shepar-ja* rites are confined to persons of slave extraction, Sheikh Farid, their patron saint, having been a slave by origin. The ceremonies appear to be connected with the fetish worship of Africa. Men and women dance around a drum covered with a red cloth and standing on a tripod. Four men beat the native double-sided drum. The dancers begin to sing. Then they work themselves into a frenzy as they whirl around.

The term *gwat*, also known as *zahr*, signifies air or spirit. The Meds believe such spirits cause every disease. The *mat*, the leader of the Gwatis, is consulted with a view to casting out the spirit. The patient is taken to a special place (*aimo*) and is placed full-length on a mat with a sheet over him and incense burning close to the nose. The *mat* now sings incantations to the *gwat*. If a man is really affected, he will tremble and sit up swaying rapidly. Then the afflicted one falls into a trance. The *mat* inquires from the *gwat* the terms upon which he will leave the man.

A meeting (*leb*) must be held, all expenses being paid by the patient. These are of different duration: *busoch* for 2 hours; *ramsa* for 3 days and nights; *tanzil* for the same time; *tubbuk* for 7 days and nights; and *zipa*, lasting 14 days and nights.

After the casting out of the spirit, music and singing commence and continue until a frenzy ensues.

MEDICINE

Medical aid was first made available in 1891–92 through the medical officer in charge of G. P. Tate's troops. Since 1904 a dispensary has functioned in Panjgur; in 1955 we met the medical officer, Dr. Allahadin, who was for many years in the service of the Anglo-Iranian Oil Co. In 1860, Assistant Surgeon H. Cook wrote in the *Transactions* of the Medical and Physical Society (new series, no. 6, Bombay) that fevers of virulent types, often accompanied by hepatitis, were rife, especially during the date-ripening in August. The commonest diseases were malaria, stomach diseases or disorders, and acute and chronic ophthalmia. Among others recorded were acute and chronic bronchitis, chronic rheumatism, ulcers of the extremities and skin diseases.

Two types of fever are recognized by the Baluchis: (*a*) *gohari-tap* or fever and ague; and (*b*) *garmi-tap*, fever with high temperature which is believed to last for 3, 7, 14, 21 or 40 days.

Whooping cough (*karantit-e-kullag*) prevails periodically among the children, sometimes causing mortality. Among the hill people, there is a serious cough (*samag*), believed to be caused by the *samag* fly entering the throat; only graziers are afflicted. Ghee mixed with tobacco is used as the remedy.

Many kinds of sores, ulcers and tumors were seen. Diarrhea, dysentery (*dor*) and colic are not uncommon. General debility, resulting from bad nutrition, is frequent.

Night blindness sometimes occurs among the poorer people of Kech, Kulanch and Dasht, whose staple food consists of boiled sardines and dates (*laghati*). This is attributed locally to the entire absence in their diet of ghee and other fatty substances. It is believed that by eating the part of a sheep's liver called *shapi-korag* a cure will result.

Epidemics are cholera, smallpox (*grampuk*) and chickenpox (*sohrak*). Plague broke out in Kech during 1838. *Hajji* Abdul Nabi estimated the loss of life at 1,500, mainly women and children (JASB, vol. 154, 1844). Cholera appeared in Kech 64 years later during August–September and 1,200 persons died. The mortality in smallpox epidemics was reckoned at 90.0 per cent of those attacked.

Evil spirits are counteracted by wearing colored beads or charms prescribed by mullahs. All children, especially girls, wear multicolored beads, animal teeth, decorated silver ornaments. One girl near Panjgur wore a tiger's claw set in silver. Blue beads are used against the Evil Eye, but they are not as common as in other areas of Southwestern Asia.

In cases of prolonged fever, the patient is wrapped in the skin of a female goat in summer and that of a male sheep in winter. A brown or black skin is preferred. The animal must be killed at night, behind closed doors, so that any chance of exposure to the heavens may be avoided. At dawn the patient is unwrapped and the skin hung on a tree away from the house. Barley (*arzun*) flour is rubbed on the patient. This cure, believed to be infallible, is called *post*. Chicken soup is a common remedy in milder ailments. Branding is employed in more serious cases.

For sore eyes, a most common complaint, a stone, called *singistan*, is boiled 7 times, each time with a separate sheep's head, after which it is rubbed in human milk and the water of a *hukka*, or, in their absence, in plain water, and the fluid applied to the eyes.

For colic, a little watered gunpowder is drunk, or the intestines of a yellow hen are bandaged over the stomach.

Lunacy is attributed to a jinni, who is cast out by the mullah (*amil*), by invoking the aid of Shah Bakhtanus, king of the jinn, and the 2 monkeys of Habbash (Abyssinia, now Ethiopia) and Zang (Zanzibar).

BODY-MARKING

Tattooing and the use of henna and kohl were observed during our traverse across Makran; these notes have been included in Field, 1958b.

1. Tattooing (B. *khayal*).
    - *a*) Spot at nasion for beauty.
    - *b*) Circle of dots on wrist when it hurts from dislocation or fracture.
    - *c*) Circle of dots on wrists for knee injury.
    - *d*) Circle of dots on ankle for injury. Many people do tattooing, both men and women (including Gypsies).
    - *e*) Women tattoo a dot at nasion, point of chin and on each temple.
    - *f*) None recorded on the body.
2. Henna (U. and B. *inam*) on both hands on festival days (U. and B. *eid*) and feet on and before marriage (both bride and bridegroom) for two days, "because Prophet used to do it." Also, old men for hair and beards "to make them look younger."
3. Kohl (U. and B. *surma*) for eyes "because Prophet used to do it." Children on each cheek for beauty. Also before marriage (both bride and bridegroom) and on the newborn (both sexes) on the third day.

RULES OF HONOR

Under the prevailing rules of honor (*mayar*), it is incumbent on a Makrani to:

a) Avenge blood.

b) Fight to the death for a person who has taken refuge with him. The refugee (*baot*) is always maintained by his protector so long as he remains under the latter's roof.

c) Defend to the last, property entrusted to another such as a bullock, camel, cash or ornaments.

d) Be hospitable and provide for the safety of a guest.

e) Refrain from killing a woman, a Hindu, a Lori or a boy under the age of puberty.

f) Pardon any offense if a woman of the offender's family comes to intercede with the person aggrieved.

g) Refrain from killing a man who has entered the shrine of a *pir* as long as he remains in it.

h) Cease fighting when a woman bearing the Koran on her head intervenes between the parties.

i) Punish an adulterer with death.

Blood may be avenged only by taking the blood of the offender, but if the offender himself be out of reach, his nearest relation, such as his brother, father or cousin, is slain. Such a system is soon liable to extension, with the result that the life of any member of the offender's tribe is taken, and so a blood-feud, unless nipped in the bud, develops by leaps and bounds until either the authorities or friends intervene and the parties are induced to arbitrate.

The losses on either side are then calculated. If numbers are equal, compensation is paid to the side which lost the last man (*gud-jang*). However, if one side has lost more than the other, compensation has to be paid for the balance of lives.

DEATH

The method of burial usual among Moslems is in vogue, the body being laid north and south, with the head inclined to the west. The Zikris follow the Mohammedan custom, but omit the prayer for the dead (*namaz-i-janaza*). The mourning is kept up for 3 days after death in the case of a person more than 7 years old, during which time visits of condolence are received and prayers are offered for the soul of the deceased. The men remove their turbans and wear a sheet hanging on either side of their Baluchi cap, while the women, dressed in black, take off all ornaments except the nose rings. People coming from a distance to condole with the relatives of the deceased are entertained by the women. The mourning in the case of a child under 7 lasts for one day only.

The wandering Loris and nomad Baluchis, when away from centers of population and unable to procure shrouds, bury the dead man in his clothes. The Meds will never take a corpse through the door of the house, but break down a portion of the mat wall large enough to allow its exit.

Chapter V

TRAVERSES FROM PASNI TO QUETTA

ON MARCH 20, the S.S. "Daressa" made a special stop 6 miles offshore to allow the members of the Expedition to disembark.

As we approached Pasni (Latitude 25° 18′ North, Longitude 63° 28′ East), which lies about 200 miles west of Karachi, we were in a large bay, the southern extremity of which is dominated by a sandy spit connecting Ras Jaddi (Juddi) and Jebel-i-Zarrin (Zarrain) overlooking the Arabian Sea.

Pasni Bay is shallow, with a sandy bottom and considerable surf breaks on the long stretch of sand. The shallow approach to Pasni prevents large native boats from discharging cargo. About 100 yards from shore, the cargo is transferred to small craft and then carried by hand through the surf. The distance from high to low water is about 60 yards.

Two white mosques, built by the Meds, and a white bungalow dominate the approach by sea. The rest of Pasni is composed of many mud huts and dwarf-palm shelters. There is no vegetation except a few date palms (*Phoenix dactylifera*).

Pasni

Ashore we were met by the District Commissioner, Pirzada Faizullah Shah, who had driven 65 miles from Turbat. We were surrounded by 50 curious villagers—Mediterraneans with a considerable degree of Negroid blood. They were uniformly medium tall, with dark brown hair and eyes. No trace of submerged blondism was seen.

The population seems to have varied considerably during the past 60 years: in 1895, about 200 Meds and Kalmatis; in 1906, 306 houses with 1,489 Meds; and in 1951, 1,369 houses with 6,170 inhabitants.

Water is obtainable from the Shadi and Doshi rivers. Good water is brought from the bed of the Shadi Kaur, some 5 miles from the coast. This river falls into the sea about half a mile to the northeast of the village.

The chief exports are wool, ghee, cotton, dates, dwarf palm (*pish*) and their berries (*konar*), mats, fish, and shark fins. Imports include piece-goods, sugar, oil, grain and flour. The large native boats are called *dangi.*

Along the beach lay decomposing heads and jaws of sharks. The boats drawn up on the sand glistened with oil from shark livers applied as a varnish.

We drove by Jeep south and then southwest around Pasni Bay, past Ras Jaddi (60 feet), and continued eastward across hard, sandy surface with soft patches to the rocky outcrop of Jebel-i-Zarrin (416 feet) overlooking the Arabian Sea, to a point 6 miles from Pasni. Here the escarpment is about 70 feet high.

We passed east of 2 villages, each with about 30 dwarf-palm huts, standing on the southern flank of low, sand-covered slopes. Just before reaching the eastern end of Jebel-i-Zarrin, 2 small Moslem tombs, one partly in ruins, nestled under the northern escarpment.

Along the shore we collected shells and marine specimens. In the tide pools were small fish and crustaceans. Nearby lay profusions of small shells, remains of crabs and larger, bleached shells. We were informed that pearls were found occasionally in the oysters clinging to rocks.

Two small rock shelters eroded by wave action into shaly bands were examined. At this point the geological formation is of especial interest. Dark strata of hard shale lie almost vertical across Jebel-i-Zarrin. Near the water, the strata run vertically in long, dark bands.

On the return trip to Pasni, we detoured northwest to approach 12 salt pans (15 x 4 feet). These pools at Wad-Rop are filled by salt water springs. Every fortnight the evaporated salt, about 50 maunds, is collected.

Near the village on the left 2 boys were repairing nets and 4 men, standing beneath mat shelters, were turning wooden wheels to make net lines.

During the afternoon Mrs. Field, accompanied by Mohammed Idris Saddiqi, photographed village scenes and some of the men, women and children in Pasni.

Back in Pasni Rest House, we were told about 3 points of interest which time did not permit us to visit:

1) The ruins of a city to the northwest; this was probably "the rich and beautiful city of Pesani" burned in 1581 by the Portuguese under Luis de Almeyda (*see* J. Stevens).

2) Kalmat (Latitude 25° 25′ North, Longitude 64° 2′ East) is believed to be the Calama referred to by Arrian in his *Indica* when describing the voyage of Nearchus in 324 B.C. from the Indus to the Persian Gulf with part of Alexander's army. In 1904, there were 28 residents and in the surrounding area 900 Sangurs and 100 Kalmatis. In 1951, there were 84 houses with 360 inhabitants.

3) During our approach to Pasni Bay, we saw Haptalar Island (Latitude 25° 6′ North, Longitude 63° 52′ East), which lies about 16 miles off the coast and 26 miles from Pasni. It is 3 miles from east to west and 1 mile wide. A detached hill (260 feet) at the western end is connected to flat-topped hills with steep cliffs. On the southeast side of the top of the island there is reported to be a shrine (6 x 6 feet) of rough stones, containing a few rough stone images covered with red oxide of lead (*sendur*). Locally, it is believed once to have been a stone building with a small reservoir. Ancient Hindu legend relates that both disappeared mysteriously after desecration by Arabs, who threw the intestines of turtles into them. Now, whenever an attempt is made to lay a permanent foundation for the shrine, the bricks are scattered by unseen hands. Haptalar (B. *hapt* = 7 and *talar* = a rocky slab) was known to the Arabs as Astalo, to the Meds as Astalu and to the Hindus as Satadip. It has been identified with the Nosala of Arrian (*Indica* 31), who describes how Nearchus sent a ship manned by 30 Egyptian oarsmen to sail around the island, but not to land. Since all were afraid, Nearchus led them ashore and dispelled by his presence the story that "if anybody be so imprudent as to venture on shore there, he immediately disappears and is seen no more." Hindus believe that Haptalar is the abode of the goddess Kali Devi, hence a place of pilgrimage.

The Pasni Meds hold several places sacred. On a rock in the northwest corner are said to be the footprints of Duldul, the horse of Ali. Nearby on the beach stands a small enclosure decorated with red flags and dedicated to Kwaja Khizr, patron saint of the Meds, who take omens here at the beginning of each fishing season after performing blood sacrifices.

PASNI TO TURBAT (MAP 1)

At 1630 hours we left by Chevrolet pickup for Turbat about 65 miles to the northwest, the rest of the Expedition staff and equipment to follow by bus.

The clearly defined track led over sand dunes onto a plain surrounded by low hills, then across a salt marsh (Ar. *sabka*) with water pools.

About 20 miles north of Pasni, steeply eroded yellowish-brown mud-stone hills (600 feet) dominated the eastern horizon. This landscape in its barrenness created a deep impression—an unsurpassed loneliness. A few xerophytic plants struggled for existence. No bird wheeled in the sky. The earth seemed devoid of life. During the brief halt to photograph these scarred slopes, our very presence seemed sacrilegious to Nature.

We recrossed the Shadi Kaur, followed the stream bed of the Garuk Kaur to its juncture with the Sukau Kaur, and turned northwest to follow the former. In a meander of the Shadi Kaur we saw a large gray heron standing on a rocky bar downstream. Pink oleanders (B. sing. *zatch*) flourished in the stream bed and along both banks. Dwarf palms (B. sing. *pish*) cover large areas of the stream bed.

The driver informed us that in this wilderness lived black buck, deer, wild boar, wolf, hyena, jackal and fox.

At Mile 26 we halted to examine the fossiliferous mudstone conglomerate at the juncture of the combined Shadi Kaur and Pidarak (Pidark) Kaur, and the Garuk Kaur. The eroded hard cap overlying clays has been carved into fantastic shapes by the action of geological agents, mainly eolian.

After passing through a gorge, the track crosses a rolling plateau, beside Pidarak (Pidark) Fort amid a date palm grove and between more palms to Damcol Kaur, which flows across the tract. Here, at 1955 hours, we were 50 miles from Pasni and Turbat lay 15 miles ahead.

A spring near the ford bubbled copiously into a narrow ditch, but we did not dare to drink for cattle tracks surrounded the muddy water. The Pakistanis, however, drank eagerly, commenting on the sweetness of the water. Other springs were reported in nearby Damcol and Pidarak.

As darkness covered the landscape, we drove through the Gokhprush Band and down onto the plain toward the Kech River near whose southern bank stands Turbat. We had traveled the 65 miles in 7 hours. (For traverse details, *see* ADIM No. 5185, pp. 53–97).

TURBAT

This is the chief village in Kech (Kej), located on the left bank of the Kech Kaur.

The inhabitants consist of Rinds of the Rais section, Darzadas, Zikris and a few Gichkis. The population has been estimated as follows: in 1900, 2,000 in 400 houses; in 1951, 3,550 in 587 houses.

There are few shops in Turbat, but in private houses we purchased some ethnological specimens, including a cradle (*goanzag*) wherein a baby is kept from 6–12 months. The hands are tied by the side for they believe that "the arms are naturally weak and will break if not tied down." The pillow (*sarja*) is filled with sand (*rekh*), which causes artificial cranial deformation.

The land surrounding Turbat is well cultivated and irrigated. Water is available from several large *karezes*. There are scattered date palms and in the garden of the District Commissioner, Pirzada Faizullah Shah, were several mango trees.

At the western end of the village lives Nawab Bahai Khan, the Nawab of Makran, and his sons, Nawabzada Hamidullah and Sheikh Umar.

The Zikri followers cluster around Turbat, sacred places being Shirin Do Shurm stream, Koh-e-Murad (the Zikri Mecca), Barr-e-Kahur (the 7 *kahur* [acacia] trees) and the closed Zemzem well near Turbat Fort. On a hillock 1 mile west of Pidarak and 2 miles southeast of Turbat, there stands a tree known as the Barr-e-Kahur. It is said that from the heart of this tree the founder of the Zikri creed produced a volume of the sect's religious code. A shrine consisting of a mud dome with a few flags stuck in it lies at the foot of this hillock, which is resorted to by Zikri pilgrims.

We were told the story. The founder of the Zikri religion preached to an unheeding audience beneath a huge acacia (*kahur*) tree. Then he began to write, leaning against the tree trunk. Two years later a crowd gathered to attend a local wedding. Desperate for attention, the prophet asked a disbeliever if he had ever seen blood gush from the earth.

Marking the spot, he ordered the man to sink his sword up to the hilt. Amid a huge crowd, the sword plunged downward. Blood spattered the man from head to feet. The crowd fell to its knees.

The prophet then commanded the swordsman to cut into the great acacia at a certain spot. From the hollow a document was extracted. These became the precepts of the Zikri faith.

On March 21 we drove 3 miles west from Turbat Rest House to Shahi-Tump, one of the most famous archæological sites in Baluchistan. Sir Aurel Stein (1931) excavated a deep trench in the center of this mound. Here we collected a representative series of painted and plain sherds from the surface.

In the afternoon we drove across the Kech (Kej) River due north for 4 miles to Miri Fort, which stands on an eminence overlooking the river.

MIRI FORT

In 1870–72, Major Beresford Lovett gave the following account of this village and fort:

> Miri is the chief village, though not the largest, that being Turbat. The fortress of Miri looks very picturesque at a distance, as then it resembles a grim square four-towered castle, perched upon a rocky eminence overlooking the surrounding villages, fields, and dark-green date-groves. The distant background formed by the hills in the Kolwah direction has a fine effect, which, however, is rudely dispelled on a nearer approach. The grim mediaeval-looking castle fades into the ugly reality of a paltry mud enclosure; the pretty villages are found to be but collections of miserable hovels of mud and thatch, and the soft blue hills are shown to be but arid bare rocks glistening and sweltering in the sun. Kej is reputed to be the hottest place in all Makran, and this not unlikely is correct, as even so early as the month of March, whilst surveying in the neighbourhood, I observed the thermometer in the shade marked 125° Fahrenheit.

Miri was formerly the most important of the Kech villages, and until about 1890 was the residence of the Naibs of the Khan of Kalat.

To the east of the fort is a long and thick date grove in which lie hidden a number of small hamlets. Constructed of mud intermixed with round stones, Miri was considered next to impregnable. There is a tradition that it was built by Bahman or Ardeshir, son of Isfandyar, of the first dynasty of Persian monarchs who, legend says, met his death in Kech. Earth for the mound was brought from several miles distant by soldiers of his army. Makran was a province of the Persian Empire, and the kings, on the occasion of a tour through their provinces, usually left mementos of their visits. Thus, in Kech, 2 *karezes* are named "Kaooree" and "Kaikhosree," the construction of which popular account ascribes to the ancient monarchs whose names they bear. Another informant states that "Makran was the penal settlement for Persian convicts, from whom sprang the original Makrani race. As I have been frequently told, the name 'Makran' is from 'Makar,' deceit, and means 'country of rogues'; perhaps the two statements may be matched together."

We climbed slowly up a narrow, winding path amid small boulders, to the northeastern corner with a ruined tower high overhead (fig. 47). Amid the ruins on the summit, we collected a few plain sherds. The view across the broad Kech River to the south was superb. Around the base of Miri Fort many thousands of date palms flourished. Acres of ripening wheat testified to the industry of the few inhabitants (10 houses) of Miri village. Hasham (fig. 46) stopped to drink from an irrigation ditch.

I climbed alone down the southern flank to the edge of the river and turned west beneath the towering crags and up to a col at the western end of the Fort. Here, in a large, rectangular, walled enclosure, I found many types of unpainted sherds of different firing and quality. At the base of a washed-out gully were some painted sherds, indicating early occupation of Miri. The latter resembled Shahi-Tump ware. We returned to Turbat at sundown.

Turbat to Mand (Map 2)

The following morning at 1000 hours we left in 2 cars for Mand near the Iranian frontier. Crossing the Kech Rud, we drove past Miri Fort and village to Kalog Zirabad, with 127 houses (population, 580) bordering the road on both sides. In this area there are many bushes, some thorn trees and a few tall trees.

We passed a *karez* on the right. We were informed that a *karez* requires 4 men for 2 months to dig one mile. The longest is about 6 miles, the shortest about 2,000 yards. When building a *karez*, the cost is estimated at 3 rupees per yard. Half of the total cost is advanced by the Government. The average total cost of a *karez* is 10,000 rupees. Beside the track were many thorny bushes with yellow flowers. There were small yellow birds and white butterflies. We stopped to talk with 6 Baluchis on their way to nearby Kalatuk.

Each man had dark brown hair and eyes. The skin color was medium dark brown. The face was medium long and medium broad. The nose was also medium long and medium broad. In physical type, they looked like dwellers on the Iranian Plateau; in fact, they would have passed for Kinareh villagers from near Persepolis in Iran (Field, 1939).

Thirteen miles from Turbat, we entered Kalatuk (Kalatak) with houses on both sides of the road. Some of the houses appeared to be constructed of well-built mud-brick. In 1951, there were 81 houses with a population of 570 persons. These villagers appeared to have broader noses than those in Turbat. There were several Mediterranean admixtures, but I did not see any individuals representative of characteristic Iranian Plateau types. There were many *karezes* among the scattered acacia trees; from this point the mountains appeared to converge directly ahead to the west. Inside a thorn fence, 30 acres of wheat were ripening.

We halted about one mile west of Nodiz to collect unpainted sherds on low Nodiz-Damb (120 x 60 x 3 feet) on the left of the track. Hasham caught a grayish-white snake about 40 inches in length. Some herbarium specimens and sand samples were collected.

Just before reaching Nodiz, which lies about 100 yards left of the track, a big *karez* crossed the road. On our way to the village, we passed 50 black goats. Here we stopped to buy some dates (B. *kahurma*, U. *kajur*). In the distance in the center of the village were two mud huts with many wall designs. We stopped underneath a large *kahur* tree with a base 5 feet thick and about 30 feet high. The Baluchi water-carrier (fig. 45) possessed wide masseter muscles, a narrow chin and a broad nose, obviously with some Negro blood. Two other men possessed Iranian features. One woman (fig. 45) had dark brown skin, dark brown eyes and hair; her face was medium long and wide; her teeth were excellent and white. She wore red flowered pants with a jacket and a black three-quarter length coat. Around her head and shoulders wound a mauve wimple. After two large plates of dates had been eaten and a silver dish drained of its sour milk, we returned to the track and continued westward past a chain of 15 low mounds, each about two feet high, which demarcate the road.

We passed Golani with 22 houses and a population of 240. Just before reaching Nasirabad, we passed many palm trees on the left. Just south of us a few miles is the juncture of the Nihing Rud and the Kech Rud, which flow in a southwesterly direction into the Dasht Rud. In 1951, Nasirabad had 63 houses with a population of 440.

To the south, palm trees line the northern bank of the Nihing Rud, which is only about a mile south of the track. We passed Charbak (Churbuk), which in 1951 recorded 44 houses with a population of 350. My estimate of 200 mud huts seems considerably higher. In the center of the village stand two large buildings, one with a crenellated roof. The other mud huts are made entirely of palms similar to those beside the Shatt-al-Arab in southern Iraq. About 50 acres of wheat were ripening on the left.

The next village was Chakari Khan (Hotabad Chakri Khan) which had, in 1951, 49 houses with a population of 440. We passed 5 healthy-looking camels. The road ran over gravel and sand which was rough in places with many small depressions; a gray-white lizard (12 inches long) raced across the road.

At 1300 hours and 37 miles from Turbat, we passed Balachah (Balichah) village, on the left about 500 paces, amid palm trees. In Balachah there is one two-story building with no windows on the road side; around this are 50 huts of Arab type. In 1951, there were 142 houses with a population of 670. A ruined building stands on top of a mound (20 feet) on the left.

Three miles west of Balachah we entered a grove with thousands of magnificent date palms averaging 35 feet in height; some of them were at least 50 feet tall. Wheat was growing in open spaces within the grove, which is about 300 paces wide. Two men were reaping wheat with hand sickles. Directly ahead lay the Nihing River. At this point, the river bed is about 800 yards wide and is covered with patches of sand and well-worn pebbles. Near the western bank, a swiftly flowing stream (100 feet wide and 12 inches deep) had to be crossed. To the west, the river had formed a large, greenish lake with a twenty-foot escarpment on both sides. A small "dust devil" raced down the river bank toward us.

The road winds through rough gravel amid thick vegetation. To our left lay a small village with about 50 huts. Under a four-beamed hut thatched with palm fronds a baby's crib hung in the breeze. Directly ahead, in the far distance, mountains of Iran were visible.

In a few minutes we came to Asiabad which in 1951 had 132 houses with a population of 580. From a distance, we saw many domed buildings about 15 feet in diameter and 12 to 15 feet high. To the right of the track stood a *mihrab*. About 3 miles to the west we came to Nazrabad (Nazarabad) with a dozen mud buildings near the road; 3 had crenellated tops. In 1951, there were 224 houses with 900 population.

An ancient mound lies 500 paces west of Nazrabad on the right off the road about 250 meters. We were unable to halt. The track leads due west across a flat gravel plateau about 8 miles wide with lines of parallel hills on each side. To the north, the Sardi Khan Range, with a high peak to the northeast of Nazrabad, rises to 3,685 feet.

A line of palm trees just to the north of the track leads into Kosh-Kalat (Kush-Kalat) which in 1951 had 88 houses with a population of 320. The majority of the mud-brick houses close to the road had flat roofs.

Beside Duraki village on the right extended a band of palm trees—here were 50 palm-thatched huts and a big fort ahead at the end of the palms. This is a rice-growing area. Directly ahead lay Tump with the fort standing out beyond palm huts and palms. A lone acacia (*kahur*) tree about 30 feet high stands beside the road. There were 20 graves on the right.

We halted at the Tump Customs House—a mud-brick building (30 x 30 feet) with 5 arches facing the road. We were 50 miles from Turbat; the time was 1400 hours. We turned sharp right into Tump village where several mud-brick buildings were well ornamented. Across a gravel patch in front of palm trees stood several large, mud-brick buildings. We continued westward toward Mand. About 3 miles west of Tump we came into Dazin (Dazan), which in 1951 had 104 houses with a population of 470. About 30 miles to the northwest we could see the Hamzai Band, whose eastern end is split by the Nihing Rud.

About 6 miles west of Dazin the track twists into a wadi (200 feet wide) and up 15 feet onto a plateau. In this area the mudstone hills which run parallel to the road on the left reveal intense folding with conspicuous anticlines and synclines.

In this area we saw 2 brown doves and 2 gazelles with no white marks; their horns were small and curved. The mountains to the south were about 3 miles from the road; to the north the Hamzai Band appeared to be about four times that distance. These 2 ranges appear to converge on the skyline ahead. Near some palms on the right about 30 acres of wheat were growing. Gawak (Gowak) lay on the right near the road. In 1951, there were 104 houses with a population of 370. The majority were small huts, but there were a few large, rectangular mud-houses. Just west of Gawak was a graveyard with about 100 graves on each side of the road. The principal water supply for this village was from a large *karez.* As the road crossed a rough mudstone area, a solitary hill called Min Trab loomed ahead near some palm trees.

After passing Galab village with 10 huts on the right, we came to Min Trab—the road winding past just on the left of this solitary hill. Two miles ahead lay Mand Fort which we entered at 1600 hours, having covered 75 miles from Turbat.

This Fort and the nearby village lie at the westernmost end of the Kech Valley. Well irrigated (20 x 9 miles), Mand produces excellent wheat, dates and pasturage. In 1903, there were 3,800 inhabitants, the principal groups consisting of Rinds, Rais and Darzadas. The Rinds, who predominate, are Sunnis.

In 1951, Circle Niabat Mand had 1,279 houses with 5,540 inhabitants. Mand Militia Post had 8 houses inside the Fort.

We were taken through the courtyard upstairs to a large room with big windows facing the Iranian frontier which lay about 10 miles due west.

On the skyline looking out that window we could see the hills and, in the distance, the mountains of southeastern Iran in Persian (Iranian) Baluchistan.

We were informed that there was a large cave near Ispikan, about 20 miles northeast of Mand. This should be investigated.

Mand is a district of Makran lying to the west of Tump, but is a continuation of the same valley in which Tump and Kech are situated. It occupies that part of the great Kech Valley lying between Pishin and the Nihing River, which, until it turns abruptly eastward through Tump, forms the frontier of the country which once acknowledged the supremacy of the Khan of Kalat. To the north Mand is bounded by the Kech Band, in which the Shairas Koh is a principal peak, and also by the Hamzai torrent; to the south by the Nigwar Range or by the Jhal Koh, which divides it from the Dasht District; to the west by the Iranian Frontier. In addition to the Nihing River, there are 2 small streams, the Mandi Kaur and the Chukab Kaur. The former is the larger; the latter a mere watercourse. They both run southeast and join the Nihing, and are dependent on rain water.

With the permission of the Commanding Officer, I was allowed to talk to the Sergeant, who stated that the 25 men in Mand Fort were recruited locally. They were lined up for inspection in the courtyard below. Passing down the line, it was quite clear that these looked like dwellers on the Iranian Plateau. Several of them were of the characteristic Iranian Plateau type with a large, convex nose. In general the hair was dark brown, almost black; the eyes were dark brown, the skin color tended to be relatively dark—the majority were brachycephalic. They looked like members of the Bakhtiari tribe in Khuzistan.

The Sergeant gave their place of origin as far to the west as he pointed across the Frontier of Iran.

Anthropometric measurements were impossible. However, Mrs. Field took racial type photographs of some Baluchi Rind tribesmen, on whom I recorded notes (p. 113).

Upon leaving Mand Fort, we were guided to Kalat-Damb, a low mound about 1,000 paces northeast of the Fort. Here some plain sherds were collected. Soundings should be made here. We reached Tump at 2000 hours. Here we were the guests of the Sardar of Tump, the son-in-law of the Nawab of Makran.

Tump. This is a cluster of forts and villages, at an altitude of 500 feet, lying 30 miles to the west of Kech and closely resembling the latter. The Gichkis are the local chiefs. In 1869, the Persian Government strove to establish claim to the possession of Tump, which might have been enforced but for the intervention of the British Government. The mud fort at Tump is a commanding structure surrounded with a mud enclosure having occasional turrets. A small hamlet lies inside the wall. The valley here is about 12 miles wide, in the center of which flows the Nihing and along it to the eastward lies a long belt of date groves in an almost continuous line for miles. There are 14 hamlets, most of them in date groves, the principal being Pulabad, Nazrabad and Kohad. These are inhabited by Gichkis, Rinds, Hots, Rais and Darzadas.

Rice is reaped alternately with *juari,* beans and pulse. Carrots and onions are also cultivated. The gardens yield figs, almonds, plantains, citrons, oranges and lemons, but dates are the staple production. The difficulty is want of camel fodder, the ground outside the belt of cultivation being stony and barren. In Tump Fort reside weavers, who fashion coarse silk and cotton cloth, and a few carpenters and smiths, who make the simple agricultural implements used by the people.

Some tall *hariali* grass flourished on the banks of the river. Two *karezes,* in addition to the Nihing River, form the water supply, the former being used for the irrigation of the date groves.

In 1906, there were about 8,000 persons; in 1951, 256 houses with 1,100 inhabitants.

Early in the morning we went by camel and horse on a hunting trip beside the Nihing River. There were many kinds of small birds, including yellow and brown ones about the size of a dove. Wild boar were reported; none was seen. Alligators were said to live in several large pools.

Upon returning we visited the Old Fort in Tump before leaving for Turbat.

We followed the same track through Nazrabad across the Nihing to Nasirabad, where pottery was collected from the slopes of an ancient mound.

Beyond Nodiz we came to Kalatuk (Latitude 26° 2′ 18″ North, Longitude 62° 2′ 40″ East) at an elevation of 295 feet above sea level; here we halted for 30 minutes.

The inhabitants are Rinds belonging to the Feroze and Sada Badi Sections. Formerly, there were numerous household slaves (*ghulam khana*). At the beginning of the century there were 400 houses with about 2,000 persons. At that time there were 200 camels, 400 sheep and goats, 300 cows, 100 horses, and 250 donkeys.

The land is well irrigated, both from *karezes* and from canals carried from the river, on the north bank of which the village and its cultivation are situated. The products are: (*a*) dates, for which Kech Valley is celebrated, and which are exported to surrounding villages; (*b*) rice (*shali*); (*c*) cotton (*rui*); (*d*) wheat (*gandum*); (*e*) millet seed (*arzan*); (*f*) some Indian corn; and (*g*) beans. Next to dates, rice is cultivated in far the larger proportion and forms one of the exports.

In 1951, there were 81 houses with 570 inhabitants.

We arrived back at Turbat Rest House just before sunset.

On March 24 I recorded anthropometric measurements and observations on 32 Baluchis belonging to the Makran Militia. Mrs. Field took front and profile photographs of each man (figs. 97–103). Idris acted as interpreter and recorder. Later we went to Abshar, which in 1951 had 307 houses with 1,450 inhabitants. Abshar is located 1½ miles northeast of Turbat Fort. Here we purchased some Baluchi ethnological specimens, including silver jewelry (pendants, bracelets and anklets) and a musical instrument.

Turbat-Hoshab (Map 3)

The road out of Turbat leads due east along the southern bank of the Kech Rud past Kush Kalat to Chakri. To the north across the Kech lie Sharak, Hirok Sami and Kalag. About midway to Hoshab the Gish Kaur enters the Kech Kaur from the north. Several villages dot the low-rolling, alluvial plain. The road traverses the valley bounded on the south by the Gokhprush Band and a similar line of hills to the north. After passing Korag-i-Bent village the road winds into Hoshab, where we passed the night in the Rest House. Fuller details of this traverse are given in ADIM 5185. In the late afternoon we were informed about a huge cave near Tang (Tank) about 12 miles east of Hoshab. Driving there in the jeep, we climbed to the top of a hill to overlook a deep valley (450 feet) with a stream (250 feet) and large pool. Beside the water rose a sheer cliff of yellowish marl containing rolled pebbles forming a conglomerate about 15 feet above the present water level. The cave proved to be two small tunnels (15–20 feet long) eroded into the bank. There was no evidence of human habitation, ancient or modern. We returned to Hoshab after dark.

Early next morning Idris and I were guided by Mr. H. A. Abidi to two small mounds (*dambs*) near the Kil Kaur. These mounds lay about 3,000 paces to the southeast of the Rest House. Here I found a splendid series of flint microliths and flakes. In addition, Idris and I collected some unpainted sherds. Trial trenches should be dug here.

Hoshab-Panjgur (Map 4)

On March 26 we left Hoshab following a course due north past Mazari and across a large salt flat (*kap*). At the northern end the road turns northwest across layered slate and eroded platy limestone (fig. 48) to the foothills. From here the road leads due west to the Gazai Kaur which it follows north and northeast toward Panjgur. About three-quarters of the way from Hoshab-Panjgur we came to a very large salt pan (*kap*). Here we left the rough track and turned west onto the flat salt bed in search of a herd of black antelope often seen in this flat area. Mirages abounded. On each side of the *kap*, black rocks jutted from the calcareous packed mud. We asked a shepherd about the black antelope; he pointed vaguely into the distance. None were seen. We returned to the track and shortly thereafter saw two mounds (*dambs*), where we halted long enough to collect some sherds. These two sites (Surain-Damb and Gwargo-Damb) seemed worthy of further investigation. The track crossed the Gwargo Kaur and turned northeast across the Rakhshan (Rakshan) Kaur to Isai Kalat leaving Kohna-Damb on the left into Panjgur. Fuller details of this traverse are given on ADIM 5185.

Panjgur

We arrived here on the evening of March 26 and were billeted in one of the buildings of the Makran Militia. A blind boy, named Sheikh Wala, serenaded us with his two flutes (figs. 59–60).

The climate is admitted to be decidedly unhealthy in summer and appears to be relaxing at all times. A fall of snow seems to be unknown, but sharp frosts frequently occur at night in winter, generally accompanied by a strong north wind which makes the atmosphere very dirty and hazy. During this season, the climate is variable to a degree and it is by no means rare for a night of severe frost to be followed by one that is unpleasantly humid and warm. The variations of temperature between day and night are often great, while constant duststorms penetrate and cover everything with layers of sand and obscure all objects at a few hundred yards' distance. Spring and autumn are said to be pleasant, but very short. The summer is hot, but the heat is said to be tempered to some extent by thunderstorms and duststorms. There is a period of excessive heat during August–September, seldom continuing more than 3 weeks. This is called the *Khurma puz* and is the time when the dates ripen.

Rain is expected twice annually, in early spring and after the *Khurma puz.* The rainfall is moderate, but no attempts are made by the people to utilize it beyond the slight *khushkawa bunds*, which enclose some tracts of cultivated land.

Panjgur has been identified with the Kanazbun of the Arab geographers. In later times the name of this district is said to have been

Khurumabad from its chief town near Kohna Kalat, where Malik Mirza, last of the Maliks of Makran, is believed to have been killed by the Buledais about the beginning of the seventeenth century. Osman, the third Khalif of Arabia, sent an army to exterminate a wild and lawless tribe. Tradition is silent as to the result of the expedition, but it seems to have led to somewhat serious fighting, for the legend states that 5 Arab chieftains were slain in an engagement, which took place at the spot where the date groves now flourish, and were buried there. From that time and event, the place has been known by the name of Panjgur (= "the five graves"), a designation which was eventually applied to the whole district.

The date groves are also commemorative of this invasion of the district, for it is said that the principal supply brought by the Arab army consisted of dates, and that the vast groves which here cover so many square miles of country sprang from the seeds the soldiers threw away. A similar origin is ascribed to other date groves in that locality, as well as to those of Panjgur. These events must have happened during the seventh century, for it was during that period that Osman occupied the Khalifate.

About the seventeenth century, Mar Sing, an adventurous Rajput, came from Hindustan and settled briefly in Gichk.

One account states that he was exceedingly wealthy and so endeared himself to the people by his liberality that they made him ruler over several villages to prove their gratitude. The more probable account is that he established his authority by defending the villagers from the attacks of their neighbors and by successful raiding. He was consequently accepted as protector and chief of the surrounding district —that is, of Gichk. There is no doubt that then, as now, Gichk was a dependency of Panjgur, and this would bring Mar Sing into collision with the Malik of Panjgur. The result was that hostilities broke out, during which the Malik was killed. Mar Sing then married the only daughter of the late Sirdar and became ruler of the district. He had 2 sons, Malik Dinar and Mir Isa. The former went to Kech (Kej) where he succeeded in winning the hearts of the inhabitants, who made him their Sirdar, and there established the Gichki dynasty. Mir Isa succeeded his father as Sirdar of Panjgur.

Isa experienced even more good fortune. He gained the regard of the then Malik of Panjgur, who gave him his daughter in marriage with the township of Chepkan for her dower. The Malik died, leaving his son-in-law heir to his sirdarship, and all his possessions, and Mir Isa's posterity have ever since remained the dominant family in the district.

Hajji Abdul Nabi states that the Gichkis are of Sikh origin and adduces in proof of this assertion the fact that they are the only tribe in Baluchistan who never allow a razor to touch their heads. This is no proof, for, at the beginning of the century, no Baluchis ever cut their hair. He wrote that:

> Their reason for originally settling at Gichk was that they found the inhabitants very peaceable and unresisting. Soon after their arrival they commenced forays in the Panjgur District, the inhabitants of which place, not able to resist them, laid a complaint before their governor at Kej, who was a descendent of Cyrus. He lent them a force with which they succeeded in nearly exterminating the Sikhs. But the few that remained took refuge among the Brahuis and got them to join forces to attack Kej. To this they consented only on condition of having half the revenue of all the acquired districts, which they enjoy to the present day.

More recent information, however, does not bear out the *Hajji's* statement, and there is little reason to doubt that the account, according to which Mar Sing plays so conspicuous a role, is the authentic one, and is the true history of the rise and ascendancy of the Gichki family. Moreover, the present Gichkis arrogate to themselves a Rajput origin, of which they seem proud, and disclaim the Sikh pedigree attributed to them by the *Hajji.* He also recorded the enmity which existed between them and their neighbors, the Nausherwanis, at the time of his visit. According to Miles, the Gichkis are of the Esanzai branch.

The nearby village of Khubadaban, which was given to the father of Azad Khan of Kharan by Nasir Khan I, has long been a bone of contention between the Nausherwanis and the people of Panjgur. Their feuds with the "Gajars" on the Persian frontier were of long duration.

Panjgur proper lies in the western section of a valley 60 miles long and from 12–15 miles wide, between 2 parallel ranges of high, rocky hills which stretch southwestward from Shireza, gradually bending round to west. The upper, and considerably the larger, portion of the extensive valley is called Rakhshan and lies in Kharan. Like Rakhshan, the Panjgur Valley consists chiefly of the bare, stony *damans* of the hills which slope gently down from north and south and abut on the Rakhshan Kaur, the stream which carries off the drainage of the valley to the Mashkel. This stony plain is broken in many places by elevated plateaus rising above wide flats at a lower level, the result of denudation. There are no long, alluvial strips bordering the channel of the Kaur as is usually the case, and almost the only cultivable ground appears to be that occupied by the Panjgur settlements.

The Rakhshan Kaur runs through about its center, roughly dividing it. Large date groves cover its banks for miles. In each is hidden a village, some of them guarded by a fort, and many tiny hamlets are dotted about under the palms. These groves occupy nearly the whole of the alluvial soil in the valley, and under them the crops are raised, sometimes in shade so thick that it is surprising they can ripen.

Elevated gravelly plateaus form gaps in places between the groves, but seen from a short distance, their line appears to be continuous. This spot is an oasis in a barren, desolate region which surrounds it for many miles and is, in Baluchi eyes, a true Eden. It is common for the Baluchis to compare fertile and productive places with Panjgur, nearly always to the advantage of the latter.

The only drainage channel of this tract is the Rakhshan Kaur, which flows through the date groves in a shallow bed about 200 yards wide in which there is a perennial stream of good water connecting large, shallow pools. The greater part of this water is drawn off by irrigation channels to the cultivated ground under the date groves, and the little that remains in the stream is absorbed by the sandy soil which it reaches after passing through the cultivated tract. There are no indications of floods ever rising to such a height as to impede the passage of the Kaur at any point. In addition to the supply in the Kaur, 13 *karezes* exist in the locality, the water of which is utilized for irrigation. *Hajji* Abdul Nabi mentions one, the tunnel of which ran under the bed of the stream. The circumstances of its construction had, at the time of his visit, been forgotten, so the people ascribed the work to giants because of its size and the vast amount of labor it must have entailed. A long line of partially filled-in wells appeared to be the only trace of this great work. However, the *karezes* now in use afford an abundant supply.

The Panjgur settlements, beginning from the east, are Washbud, Gramkari, Khubadaban, Tasp, and Kalag, along the right or north bank, and Sar-e-Kauran (Sarkaoran), Shordo, Pir Umar, Chetkan, Duzanap and Isai, with the small hamlet of Kahan along the left or south bank of the river. Under a decision from the Indian Government, the Kharan Sirdar obtained Khubadaban, half of Tasp and the whole of Sar-e-Kauran. A few miles to the southwest of Isai stands the ancient fort of Khubadaban, now a complete ruin.

Isai, considered the capital of the district, was the residence of the Khan's Naib. Located on the left bank of the Rakhshan River, Isai is a comparatively new village, nearby Kohna Kalat having been the old site. Kohna Kalat, constructed of baked red bricks, was destroyed by the Persians. The tombs of Malik Isa and others are built of glazed bricks embellished with crude figures of men and animals. Nearby is the ancient dam of Band-e-Gillar.

At Isai in 1903, there were 532 houses with 2,660 inhabitants. The tribal groups included Kenagizais, Barrs, Kashanis and Nakibs. In 1951, there were 521 houses with 760 inhabitants.

Formerly, a small fort or keep existed in each of the settlements, but these were all destroyed by the Khan, with the exception of Tul, Shordo and Khubadaban, probably because they enabled the people to offer greater resistance to the collectors of revenue.

However, the influence of the Gichki family is not limited to the small district described above. The few inhabitants of Gwargo and part of Gichk are their *ryats*, and on the north the boundaries of Panjgur may be considered to be the line of watersheds of the Band-e-Panjgur and Azbdiha ranges and other hills which separate it from Kharan territory. Westward, the line goes to Tank-e-Grawag, where it is said Kuhak, Jalk and Panjgur all join. On the northwest it extends to the Mashkel. On the west it marches with Kuhak and Parom, and on the south extends to the line of watersheds dividing it from Kech and Kolwa, part of which is known as the Madag Band. On the east, the line passes a little to the west of Sakan Kalat and becomes very indistinct to the north of this point.

The Panjguris claimed all the country lying west of Kenagi Well, some 50 miles east of Isai, while Azad Khan asserted that his territory extended to Pir Umar. Shasowar is, however, probably on the border between the 2 territories. Thus, the Gichki family is dominant over a wide extent of country, but, with the exception of the oasis of Panjgur proper, far the greater part of it is an arid waste sparsely populated and of little utility except as a grazing ground for the flocks of the few nomad shepherds who dwell among the rocky hills.

The glory of Panjgur is in its dates, which form one of the staple foods and are exported in large quantities. They are greatly and deservedly famed for their excellence, which is attributed to the cold and to the sweetness of the soil.

The fecundation of the female date tree is effected artificially. When the spathe containing the male flowers, which resemble ears of corn, bursts, the flowers are culled and inserted amongst the flowers of the female tree. One or two of these ears of male flowers suffices to impregnate one female tree. There are about 40–50 ears in each spathe, sufficient for about 30 female trees.

The Baluchis use the pollen of the wild male date palm trees found at a distance from any date grove, as they say the produce thus obtained is finer. The palm trees are raised from seed; after the third season they bear fruit. The natives have to ascend the trees frequently for the purposes of artificial fecundation, gathering the fruit and lopping off the dead branches. They perform the ascent by means of a rope passed round the tree and also round the climber, who by alternately lifting the rope and then himself on the scars of the old branches, gradually reaches the top.

The best kind is the Muzati, and it is perhaps one of the finest dates known. They are packed in small earthen jars with the juice of inferior kinds poured over them, and the mouth then closed. A sweetmeat resembling nougat (*khush khurma*) is also made with dates, camel's milk and almonds, and is much esteemed.

In addition to dates, rice, *juari*, wheat, barley, mung, beans and tobacco are cultivated. The garden vines and trees are chiefly grapes, pomegranates and oranges. Lucerne is grown as a fodder crop, and brinjals, turnips, carrots and pumpkins as vegetables.

The amount of grain sown on the land irrigated by the Rakhshan Kaur and the *karezes* is said to be about 400 maunds, and the average yield to be about 4,000 maunds. On the *khushkawa* land in the district, namely that dependent on rain, about 4,000 maunds of grain are said to be sown annually, and the yield to vary from nothing in a bad year to 20,000 maunds in a tolerably good one, and 80,000 maunds in a year of unusual prosperity. Manuring is freely resorted to in the case of the irrigated fields; however, the produce of the land rarely suffices for the wants of the inhabitants. There is no doubt, however, if agricultural operations were carried on systematically, that the district could support a larger population than it does now, and for which its resources would be inadequate were it not for the date crops.

There are 2 harvests annually: the spring crops being barley, wheat and beans; the autumn crops, rice and *juari*. The dates are gathered in September. At some of the villages, which nestle among the date groves, there are a few fruit trees and small vegetable gardens. Isai boasts the largest and most fertile soil. The fruits include grapes, pomegranates, apples, oranges, citrons, figs, guavas, mulberries, peaches, plums and apricots. Among vegetables are turnips, radishes, carrots, beans, pumpkins, onions, brinjals and garlic. The varieties of each appear to be great, but the total quantity of both is small.

Apparently, the only mineral product of the district is sulphur, small quantities of which are obtained from a hill called "Dazi" about 24 miles west of Isai.

Prior to Partition, the trade of Panjgur was entirely in the hands of Hindus, who visited the locality after the harvests, importing grain, cloth, salted fish and metalware and exporting dates, ghee and wool. The wool is of fine quality, but is greatly adulterated, being mixed with goat's hair.

In Panjgur, as in southwestern Baluchistan generally, there are but 2 measures: (*a*) the *kyas*, which weighs 8 seers, and (*b*) the *maund*, which weighs 2 seers. In this the term has always been used to denote the Indian *maund* of 80 pounds.

The manufactures are few and unimportant; they consist of felts for camel saddles and carpeting, and coarse cotton cloths, both white and brown, the raw material for which is imported from Dizak.

All the buildings, including forts, houses and walls, are constructed with sun-dried bricks. There is no wood suitable for building purposes in the immediate vicinity of the settlements, and when wood is necessary, the trunks of date palms are used. Scrub palms (*pish*) and date fronds, sometimes woven into rude mats or covered with a layer of earth, provide the ordinary roofing materials.

In 1903, there were 16,780 inhabitants within Panjgur District. The tribal groups include Gichki, Nausherwani, Tolag Gichki, Kenagizai, Mullazai, Amirari Rais, Barr, Kashani, Rakhshani, Shambezai, Sajdi, Gurgnari, Chakrari and Nakib. The majority are Sunnis, the rest Zikris. At that time, they owned 15,000 sheep, 5,000 goats, 1,000 cattle, 50 buffaloes, 20 riding camels, 200 male and female camels, and 30 horses and mares. The camels of Panjgur are said to be inferior to those of Kech.

There is a strong Negro element in Panjgur, especially among the poorer classes. Most of the *habshes* are the descendants of slaves, but they all appear to have been admitted into and to belong to some Baluchi section. They are superior in physique to the ordinary Baluchi of the district, and seem equal in vigor and activity to the more hardy tribes who dwell further north. A few Bizanjau and Sajdi shepherds tend their flocks on the neighboring hills.

As might be expected in a region where the climate is so variable, fevers are very prevalent and various forms of ophthalmia are caused by the dust-laden atmosphere. Stone in the bladder is exceedingly common; new arrivals invariably complain of the effect produced by the water of the *karezes*. The water in the stream is far the best for drinking purposes.

The principal diseases are fever, spleen, neuralgia, eye diseases, and scurvy. The latter complaint may arise from a diet among the poorer classes consisting of dates and salted fish.

Excavations South of Panjgur

Surain-Damb. About 20 miles south of Panjgur we passed 2 mounds on the right beside the track. The more southerly, Gwargo-Damb (30 feet), had painted and plain sherds on the slopes and summit. Trial trenches should be sunk into this mound to ascertain its earliest date of occupation and to establish the cultural links.

Surain-Damb, the northern mound (25 feet), also lay on the right near the track. Mohammed Idris Saddiqi and I decided to return here to sink a trial trench (fig. 50) into Surain-Damb, since it was considerably smaller than Gwargo-Damb just to the south. The surface sherds were considerably fewer, but painted and plain ware lay scattered on the surface of the slopes and along the central ridge.

On March 28 all members of the Expedition returned to Surain-Damb (fig. 49). Six Panjguris, equipped with picks and shovels, rode on the truck. With pegged strings I laid out a trench (30 x 4 feet) across the highest point of the *damb*. A few plain sherds were unearthed down to the 1.0 m. level. A blinding sandstorm overwhelmed us at noon and caused work to stop 2 hours later.

Early the following morning Idris returned to Surain-Damb. I was incapacitated by a sinus headache. After 4 hours' work toward the northern end of the mound, Idris deduced that the upper portion of Surain-Damb had been used as a Buddhist stupa. Shortly thereafter, a workman uncovered a human skull. This caused great consternation among the 6 Panjguris, who refused to continue excavating. Since the sand was now beginning to sweep across the plain, engulfing the mound, Idris decided to abandon work and returned at sunset to Panjgur.

We were informed that there were several other mounds, probably *dambs*, lying to the east of Surain-Damb. An archæological reconnaissance in this area south of Panjgur should prove of interest.

PANJGUR TO NAG (MAP 5)

On March 31 at 0930 hours we drove due north across the Rakhshan River bed to a crossroads with a signpost pointing west to Gwarag and leading on to Dashtuk past Washap and sharply west across the frontier into Iran to Kuhak where it follows the Rud-e-Mashkel northwest to the Simish Rud.

The northern track led across the Azhdiha Kaur to Palantak. We were informed that the Panjgur-Palantak track was impassable even by Jeep. At that signpost we turned sharp right onto the main track leading to Nag. About 3 miles from the signpost to the northeast we halted at a small village on the south side of the track to purchase 6 date palm cuttings of the locally famous "Muzati" dates, the finest in the Panjgur Oasis; price 30 rupees for 6 cuttings, each weighing about 50 pounds.

We continued past several small villages of a dozen mud huts on each side of the track with a line of splendid date palms on the right for about 4 miles. This group of hamlets is known as Sarkaoran. We stopped beside one mud hut to look at some amulets worn by two little boys and one girl. These consisted of a necklace of beads with tiger claws set in silver and a local type of phylactery containing *sura* from the Quran.

We continued past a thin line of mud huts with flat roofs with ventilation holes. A *karez* supplied the inhabitants with water.

To the south a line of scattered palms demarcated the northern bank of the Rakhshan River. Low scrub palms flourished everywhere; high mountains were visible far to the north and south.

We passed a camel train of 30 animals en route to Panjgur, probably to pick up a load of dates for large palm-fiber baskets were flapping loosely on the side of each animal.

The track passed Kalag with 15 houses just south and continued across open, rolling gravel plain with some vegetation. A single casuarina tree lay far ahead near the road. Some low casuarinas flourished in this area near a chain of low gravel-covered natural mounds. After crossing and recrossing a wadi, the track continued uphill for about 150 feet, rough and twisting, then up onto a low, rolling, gravel and sandstone plain with a range of hills far to the right and mountains on the left about 5 miles distant. Two low hills ahead swam out of the mirage. We passed to the right of a stone circle, 20 feet in diameter, with 2 large stones facing east.

To the right lay a depression, approximately 100 acres, with thicker vegetation. Six recent graves stood beside the track on the right. The track led down into a valley amid many scrub palms and a few casuarinas, then through low hills and many dwarf palms. A prayer place (Ar. *mihrab*), consisting of a circle 12 feet in diameter, with the niche facing Mecca stood on the left near the track.

We passed close to some low hills on the right with platy sandstone sheets upended; on the right a 200-foot hill with vertical bands of black, shiny sandstone dominated its western exposure (fig. 51). I collected some yellow dandelions (?), which the Baluchis cook and eat like a vegetable.

The track passed between low hills with sandstone slabs standing on end to appear like man-made ruins. A defile twisted through hills then up amid waves of mirage floating across the plain ahead. In the far distance to the north and south, high mountains dominated the skyline. After crossing a valley with a steep, eastern slope the track led onto an enormous plain covered with a few bushes. To the right a "sand devil" twirled ceremonially skyward. To the left the silhouette of a camel and his master accentuated the loneliness of the great plain. Ahead lay the Shahbug Kaur, midway between Panjgur and Nag.

The track descended 200 feet into this wadi with a steep bank on the far side to the right. At this point the driver reported we were now about 40 miles from Panjgur and 35 from Nag. Once up on the plain there were large, forbidding black sandstone boulders. The track ran between long lines of black sandstone outcrops suggesting the handiwork of former giants. After crossing the bed of the Kasig Kaur, the track twists upward onto the plain which is covered with many low bushes. We passed a rectangular (20 x 15 feet) prayer place near the road on the left just before crossing the rough bed of the Nagindap Kaur, which our local driver named Mail Kaur. While crossing a plain covered with low bushes, we passed another stone circle (12 feet), which had been used also as a place of prayer. Far to the right a gazelle dashed away toward a "sand devil."

The next few miles were very rough going amid many low hillocks covered partly with low vegetation. Nag was 20 miles distant. Just ahead on the left a low hill extended across the road for about 100 feet to the right. We halted at this archæological site known as Chiri-Damb. During a two-hour halt we collected a splendid series of plain and painted sherds and some small terra cotta figurines linking this culture to the type localities of Mohenjo-daro and Harappa in the Indus Valley far to the east.

Mrs. Field photographed Chiri-Damb and four Mamassani tribesmen, one with a fine-looking camel. I also collected some ants and herbarium specimens on the mound.

After following a rough, sandy track for about 30 minutes, we turned sharp left off the track toward a low mound silhouetted in the distance. About one mile across very rough terrain we came to another ancient mound known as Seri-Damb. Here we also collected plain and painted pottery similar to that found on Chiri-Damb. Six Mamassani tribesmen (figs. 55–56) walked across from a small village of mud huts lying half a mile to the north. Mrs. Field photographed each man separately (fig. 56) and then the group.

My observations on the Mamassani were: average stature 5 feet 6 inches (1676 cms.); skin very dark due to exposure although not Negroid; hair dark brown and thick, although naturally gray in old age; eyes uniformly dark brown; face short and broad; nose straight with medium wide alae; lips medium thick with no marked eversion; and teeth in good condition, probably because of little sugar in their diet.

Leaving Seri-Damb, we recrossed a very rough, hillocky terrain back to the track and turned east toward a range with many peaks directly ahead. On the left of the track about 200 paces stood a solitary hill about 50 feet high with a hard, black cap; this is an excellent landmark. A few miles to the northeast black bands of sandstone run up the hillsides.

Across a vast plain covered with low bushes the track bends sharp left around a chain of hills, one shaped like a sugarloaf on the right. The track turns right, still amid the same hills, then right again slightly uphill around a sigmoid bend between the hills. From this point Nag is visible. Ahead lay green vegetation, a very pleasant relief from the monotony of sand and gravel plateaus.

In the distance there were trees with a low, white house on the left in front of a high hill which appeared to be a huge ancient site but later proved to be natural.

We arrived at Nag Rest House at 1630 hours, the distance from Panjgur being 75 miles.

We walked southeast of Nag Rest House across the Rakhshan River bed for about 1,000 paces beyond some palm trees amid thick, emerald-green vegetation watered by narrow irrigation ditches. Here are 2 mounds linked by a natural ramp. On the highest and easternmost mound we collected an excellent series of plain and painted pottery and found some small terra cotta figurines—all characteristic of the eastward link to the Indus Valley cultures. I also collected some geological and herbarium specimens and, with the assistance of 10 children, 63 small lizards (Appendix E) and some insects.

We walked back to Nag Rest House just after sunset.

Nag stands at an elevation of 4,700 feet, about one mile below the point where the stream breaks through a low range of hills. There is a *karez* and a little cultivation. There is running water in the bed of Rakhshan Kaur about 3 miles above the Rest House. We were informed that a rough tract led northwest to Washuk, 30 miles from Nag.

Nag to Jangal (Map 6)

On April 1 at 0830 hours we left with the Jeep and Dodge Power Wagon, crossing the dry bed of the Rakhshan River and proceeded northeast on a gravel track.

Our first brief halt was about one mile from Nag Rest House beside a small stream bounded by low, flat rocks which flows across the road (fig. 52). Naeem Beg Chugtai collected some small fish. Across the stream a circle of 50 date bags stood unattended. Their owners were off with their camels to nearby pasture and water. This is indeed an honest land despite the fierce reputation of the Baluchis.

To the east extends a broad valley running up to a range of hills, perhaps 3 miles distant. Many bushes covered the plain. As we passed between many small hills, eroded vertical strata stood out.

We passed to the left of twin hills, dark brown in color. A Baluchi shepherd, guarding about 100 sheep, waved as we passed. The track led across the center of an open plain about 5 miles wide bordered by ranges of hills. On the right beside the track stood two ruined houses of black sandstone—just beyond there were graves scattered on both sides of the track.

About 20 miles from Nag, our course continued in a northeasterly direction.

We saw some low, walled enclosures due north of the track. We stopped here for one hour in order to examine these ruins. These proved to be 4 square (50 feet), low walled (3–4 feet) enclosures, each 50 feet apart aligned in the north–south line about 100 yards west of the track. The walls were about 2 feet thick. From the center of the eastern end of each enclosure extended a stone building (6 x 4 x 4 feet; *see* fig. 54). Within each walled enclosure there were lines of graves, each covered with small boulders rising about 12–18 inches above ground level. Idris decided to attempt to open one of the graves. The overlying boulders were removed and digging began. The grave was 4 x 2 feet. At a depth of 30 inches we were forced to give up because of the hardness of the ground and the lack of proper excavating tools. The arrangement of the courses of the walls was of particular interest—many of them being in a zigzag pattern (fig. 53).

At 1030 hours we left the graveyard and drove 500 yards southeast across the Nag-Jangal track to a large mound which could be clearly seen in the distance. This proved to be an ancient site from whose surface we collected plain and painted pottery and some terra cotta figurines. On the northern slope of the summit we saw two small rooms, which had been cleared about 15 years ago by Sir Aurel Stein; these had now become almost choked with windblown sand.

A middle-aged Mamassani came over to watch our strange actions. He was about 5′ 3″ with swarthy skin, dark brown hair and eyes and gray hairs in his beard. His nose was convex with a small tip and medium alae.

After a brief reconnaissance of this ancient mound, we drove north to rejoin the Nag-Jangal track.

The track then crossed a plain about 5 miles wide with a range of hills on the right and left. A lone tree was a conspicuous landmark. A low, gray hill with black bands ringing the summit was another landmark. Another hill had folded black sandstone bands near the peak.

With mountains visible everywhere ahead the track now climbed up and down, then across a plain with many scattered bushes. "Sand devils" twisted mercilessly far to the right.

At 1230 hours we were 30 miles from Nag, a point midway to Jangal.

The track then crossed a plain about 6 miles wide covered with low bushes amid two low ranges.

Ahead on the track a sparrow hawk plucked at a dead rabbit until frightened skyward. The rabbit was gray with very long ears, brown feet covered with thick fur, a white tail and white fur on the belly.

Many gazelles were reported by our driver in this area, although none were seen.

We halted 18 miles from Jangal in the little village of Bataq, where I took the opportunity to buy some native medicines and useful plants from the local herb doctor.

The Baluchis crowded around us inside a mud hut run by a Hindu with typical East Indian features. The Baluchis were short in stature, about 5′ 4″–5′ 7″. Their heads were round, the faces tended to be short and medium broad, the hair was uniformly dark brown, the skins swarthy. The noses were small and straight; no prominent convex noses were seen in Bataq. The eyes were uniformly dark brown. The hands and feet were small. The men were intelligent, friendly and ready to assist us in every way. The Hindu store owner refused payment either for his time or for his specimens.

A few scrawny chickens pecked hopefully outside the mud hut. As we left an old Mamassani, about 5′ 4″ and with a white beard, walked over to look at us. His skin was dark brown from exposure. His nose was broad and slightly convex. He was quite a different type from these villagers.

After leaving Bataq we passed about 30 green trees (B. *batka*) near the river. Salt patches had seeped to the surface in this area. The track twisted across a wadi, then through gray hills down and up a sigmoid bend and across a gravelly plain amid low hills.

Before reaching a band of thick, low vegetation, we crossed a light-yellow gravel plain amid low hills; in the distance a high peak dominated the skyline.

We halted to search for pottery or chert flakes on the low mound beside the track; no trace of ancient occupation. About 50 road workers were widening and aligning the track. We passed their road camp of several tents. Three Baluchi drummers ran out to greet us and performed an impromptu dance (B. *chaab*) of welcome for this is indeed a lonely spot with few transients. Eight men took mincing, graceful steps, turned and clicked their fingers like Arabs and waved their arms above their heads, clapping their hands in unison. The drum (B. *dohal*) was made from a gasoline drum covered with skin, probably gazelle. I purchased the two drumsticks (B. sing. *lut*).

Shortly beyond this point the track rose uphill through sand with a following wind which caused our own jeep-made sandstorm. This was Kaparna Pass. The whirling sand was blinding and choking. After climbing uphill through flourlike, yellow sand, the track led downward onto hard-packed gravel. Ahead in an unbroken line lay high mountains. At 6 miles from Jangal we passed a signpost with the following marker: Right to Nal-Khuzdar; and left to Kharan. After crossing a gravel plain with some low depressions we saw in the distance 6 flat-topped mud huts across a stream. At 1415 hours we halted at Jangal Rest House, having covered 60 miles from Nag. Between the Rest House and the 6 small mud huts flowed a small stream. The Baluchis here had dark brown hair and eyes, swarthy skin and slightly convex noses. From one of them I bought a reed pipe (B. *punzuk*). The small girls wore long braids which were held together at the bottom by heavy silver ornaments (sing. *chotil*). Here, beside the stream, we collected some lizards and Orthoptera.

Jangal to Surab (Map 7)

At 1515 hours we left Jangal for Surab. The track crossed a wide stream with flowing water. We halted at a low archæological mound (*damb*) 2.5 miles north of Zayak spring. Here we collected chert flakes and small cores, painted and plain pottery and a series of terra cotta figurines. I found a small figurine of a camel; this is believed to be the oldest proof of existence of the camel in Baluchistan for this pottery and these figurines are characteristic of the Indus Valley cultures. Attention is called to the camel ornamenting a copper object from Khurab (Iranian Baluchistan); this specimen (cat. no. 36–91–60–4403) is on exhibition in Peabody Museum.

While we were hunting for ancient traces of habitation, a startled gazelle rushed madly down a narrow, winding wadi on the eastern edge of the mound.

We returned to the track and crossed a small wadi past an acre of wheat and continued over packed gravel through very broken country. A very high hill (1,000 feet) on the right dominated the range of mountains; the hills appeared to converge ahead. From this point the formation of the land and the nature of the flora changed noticeably. We were now entering Karaguli Gorge—the track plunged steeply down an incline amid high cliffs. As we climbed slowly up a steep incline, a large gray-brown lizard about 36 inches in length (*Varanus* sp.?) dashed into a hole under a rock.

At the bottom of the gorge heavy green vegetation flourished. We proceeded in low range with huge boulders on both sides. Several green trees flourished on the cliffs. Here the track winds through steep-sided walls amid picturesque scenery.

Midway through the gorge a standing, solitary pillar (15 feet) formed a natural gateway. On the right a small mud hut clings to the rocky wall. We were told that this was "The Traveler's Rest" for those who passed this way. This is indeed a lonely and formidable gorge. Just beyond in front of a large rock stood a tree (B. *hath*). The driver informed us that this was the wood used in the drumstick which we had purchased from the Baluchi road gang the day before.

The track led steadily upward toward the exit from the gorge. This Karaguli Gorge is one of the most magnificent I have seen. It is 12 miles long and required about 90 minutes to traverse with a few halts.

Near the northern end I collected some plants. From this point the track continues up and down across open country with a high peak (800 feet) ahead. Rounded hills lay everywhere. To the right we observed a curious rock formation. A hawk (B. *baz*) circled high above, a black and white bird about the size of a large robin. Hematite infiltrations were visible on many scree slopes.

After crossing an open plain we came to several emerald-green patches of wheat, each about 1 acre in extent; then more cultivated patches, obviously forming part of an ancient irrigation system, probably *gabrbands*.

To the left a low, natural mound had been cut by a rectangular entrance; the Baluchi owner waved as he stood outside his dwelling.

We then came to two buildings on the left: one a small, white mosque with torn flags flying in the little courtyard; the other is a former "octroi" post. This is called Gidar.

We were informed that the Makran-Kalat boundary lies on the highest point a few miles to the south.

We drove between many gray salt patches across the Jhalawan Plain. Some potsherds were seen on the surface but there was no time to stop.

The track ran straight ahead across rough country amid low bushes, then over light-colored salty patches into a deeply rutted section.

On the left just as it grew dark 3 camp fires glowed in front of 2 conical black tents where shepherds with their sheep and donkeys made ready for the night. We arrived at Surab Rest House at 2030 hours.

Next morning we returned over the track toward Jangal, which we had crossed during the hours of darkness the evening before. We halted at Surkh-Damb about half a mile southwest of Surab. Here we collected some painted and plain pottery sherds.

Running across open country we were guided to Neghar-Damb about 2 miles southeast of Surab. Here we also collected some painted and plain sherds.

After returning to the Surab-Jangal track we continued southwest to a point about 4 miles south of Surab to a large mound known as Ander-Damb. Here we made an excellent collection of chert flakes and pottery, both plain and painted ware. We also found some more terra cotta figurines of bulls and other animals. This site should be examined carefully with trial trenches.

The mound was covered with purple flowers with small bulbs. I made a small collection and also captured a tortoise. From a passing Mamassani couple (with their donkey) I purchased a multi-colored cloak, which at a distant glance resembled an Ainu pattern.

Our local guide from Surab who led us to these 3 archæological sites expressed a keen interest in hunting. He gave us the following names of local animals, although the majority are now relatively rare: black or white bear (*mamah*); leopard (*khabra*); markhor (*gud*); gazelle (*khazm*); wolf (*kaftar*); jackal (*gidar*); fox (*shok*); and hare (*kharbosh*). We returned by the same track to Surab Rest House with the knowledge that trial trenches should be sunk into these mounds and others reported near Surab.

Surab to Kalat (Map 8)

Leaving Surab at noon we crossed a gravel plain with high mountains on both sides. After about an hour we caught up with a long line of Mingalu on the march to Dasht-i-Guran. They were moving, just as do the Beduins of the Arabian Peninsula, with all their household goods and possessions; camels and donkeys were moving at a steady gait although overburdened—beside them the men, women and children. Mrs. Field took a fine series of photographs of these Mingalu on the move. They had uniformly dark hair, dark brown eyes and weatherbeaten faces. Many wore beards. One Mingalu tribesman carrying a rifle showed us the percussion caps (B. *godri*) which he was carrying in a small, red bag ornamented with tassels. Two of the very young girls wore kohl on their cheeks. No tattooing was seen.

Shortly thereafter we resumed the north-

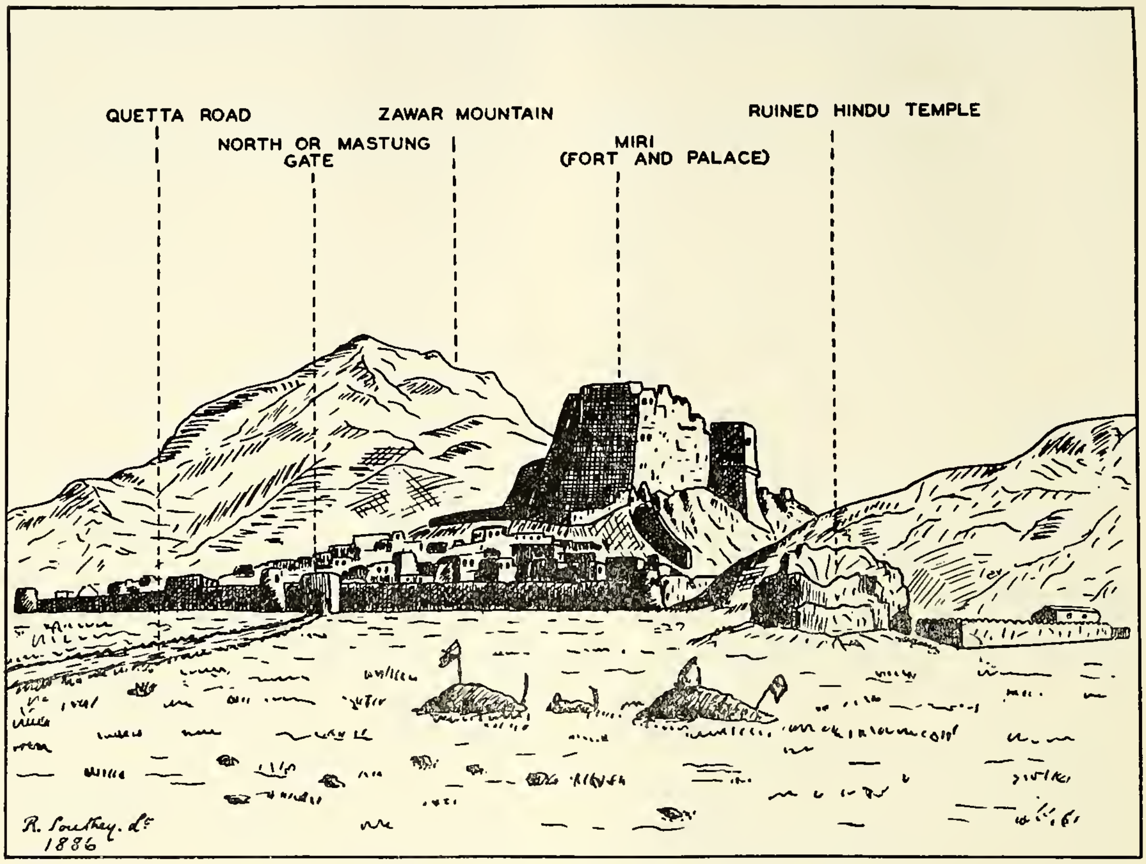

Fig. 13. View of Kalat from the north (*after* R. Southey, 1886).

ward track and passed a milestone recording that Kalat was 38 miles ahead. We stopped to photograph an old Beduin with very sore and inflamed eyes, nearly blind. As he sat high on an old camel he begged for medicine to cure his lack of vision; his guideboy, probably a relative, was seated on a small donkey.

At a point 32 miles from Kalat the plain was covered with green bushes with yellow flowers. The land was plowed on both sides of the road. In this area there are large sections enclosed by 3-foot clay walls; these are probably *gabrbands,* former evidences of cultivation.

After passing two small villages on the right of the track we came to the village of Benn Chah (Banja) which is 24 miles from Kalat; there is some confusion because two villages possessed the same name.

From the road to the east rose a high mound called Ghuram-Damb. Here we collected plain pottery fragments on the surface and, in a brief halt, were unable to find any painted sherds. I purchased 2 silver hair ornaments (sing. *chotil*) from a young Mamassani girl.

From the top of Ghuram-Damb we saw two more *dambs* below the mountains far to the right. Since the partially cultivated area was exceedingly rough to traverse, we were unable to visit these sites.

On Ghuram-Damb we saw an old woman with gray hair who had stained it with henna; she had few teeth and a small, convex nose. Her husband also had a small, convex nose, dark skin and good teeth. Another man in the group had a convex nose and excellent teeth.

We returned to northern Benn Chah and continued northeast toward Kalat. On both sides of the track there were dark green patches of cultivation. We saw a sparrow hawk circling high in the air. Many bushes (*tranaa*) grew in profusion giving a yellow effect in the sunlight. We were now 18 miles from Kalat and approaching Rodinjo directly ahead. There were about 35 houses, all flat-topped, on the left of the track with a mound in the distance dominating the plain. We halted at Rodinjo-Damb and collected a few crude, unpainted sherds on the eastern slope. We also climbed 75 feet to the cairn at the top. Nearby were several red chert fragments, suggesting a temporary camp site.

After a brief halt we returned to the track and continued northeast across an open plain with myriads of low bushes. The hills appeared to fade out on the right and left forming horns with a gap in the center. We were now 11 miles from Kalat.

Kalat appeared to be encircled by mountains. We passed a few mud huts and then a ruined outpost. The track wound among many yellow bushes and then amid hills with parallel strata on the left.

After winding up to the top we proceeded down into a valley on a white gravel road with light-colored hills on both sides and some vegetation. High on a hill to the left just before reaching Kalat stood the shrine of Pir Koshab—a piece of red bunting flying from the hilltop. Below Pir Koshab's shrine stood 6 houses. Far to the right stood the ruins of the great castle (Miri) of Kalat (fig. 13). The Miri was destroyed by an earthquake.

We turned right at the signpost into Kalat past the white buildings of the hospital beyond Daud High School and reached Kalat Rest House at 1955 hours.

KALAT

The former capital of Baluchistan is located at Latitude 29° 0′ North and Longitude 66° 40′ East at an altitude of 7,000 feet, about the middle of Kalat Valley on the northern spur of a hill of limestone called the Shah Mardan.

The strata have a dip to eastward, and a scarped face to westward. The town, built in terraces, is entirely exposed to view from every part of the valley. It is square and walled with bastions at intervals, and has 3 entrances facing north, south and east and named, respectively, the Mastung, Gilkandi and Dildar Gates. It was by Mastung Gate that the British stormed the town in 1839.

On an eminence in the town stand the ruins of the Miri (fig. 13), once containing the palace of the Khan. It is still an imposing structure, one of the most ancient edifices in Baluchistan, having been founded by the Hindu kings who preceded the Mohammedan Dynasty. From its reception hall, which had an open balcony, a most extensive view was obtained of the whole valley and of its surrounding hills. From the Miri, Chihiltan Mountain is distinctly seen, some 80 miles distant.

The whole town is completely dominated by the shoulder of the Shah Mardan at a distance of 2,000 yards from the Miri. Outside the walls are the former quarters of the Babis; their suburb is called Babi-Khel, but it is now deserted. The center of the valley is thickly sprinkled with houses, gardens and orchards. The Babi-Khel suburb is on the south side, while the suburb of Pas-e-Shahar occupies the west and northwest sides.

Few manufactures may be said to exist at Kalat except those of very rough implements of husbandry, metal ornaments for women, and shoes and sandals. The women embroider their apparel in a very beautiful manner, unsurpassed elsewhere. Rugs for tents of original patterns and colors are manufactured here by the Brahuis. Upon arrival we were greeted by some musicians and a male dancer (fig. 57). I purchased the stringed instrument (fig. 61) for the Peabody Museum. In order to obtain some of the locally made silver ornaments (figs. 62–66), we ordered a bridal set from a local silversmith.

Pottinger, in 1810, sets down the number of houses at 2,500 within the walls, and about half that number in the suburbs. Robertson, in 1841, states positively that Kalat had 2,000 houses within and 800 without. Dr. H. Cook, in 1860, considered 400 houses to be about the mark within the city, and gave no estimate for the suburbs. Thornton, in 1844, deriving his information from Government records, wrote that the population, including the suburbs, was about 12,000 persons. In 1888, according to Temple, the population was estimated at 10,000 when the Khan was there and about 7,000 when he was absent. The 1951 figures were 767 houses with 2,010 inhabitants.

Kalat Valley. This valley of Baluchistan is situated between the provinces of Sarawan and Jhalawan. With its dependencies (the surrounding valleys and villages), it formed a *Niabat* under the immediate jurisdiction of the Khan. Kalat Valley (5 x 2 miles) is bounded on the north by a low range separating it from the Girani Valley; on the east by the great ranges of the Hala system dividing it from the plains; on the west by a series of low and broken hills, backed by the loftier Siah Koh; and on the south by the drawing in of the lateral hills, a narrow pass only remaining, overhung to the eastward by a conical mountain 1,100 feet above the floor, which again has an altitude of about 7,000 feet above the sea.

Kalat Valley slopes gently to the northward. The soil is rich, requiring only irrigation to be very productive. It has one permanent stream, 6–8 feet wide, which rises from the base of a limestone hill on the eastern side of the valley, opposite the town of Kalat. The water is clear and relatively pure; the quantity is apparently uninfluenced by rain. After being conducted some few hundred yards, the stream is artificially divided into 3 principal channels, by whose further subdivision the valley is plentifully irrigated. Its source is probably in the base of the mountains, as it is always delightfully cool in summer and warmer than the air in winter. Pottinger (1816) makes a strange assertion to the effect that it is warm all night until sunrise, when it becomes quite cold. The truth is that the water is of an equable temperature, but by contrast feels warm when the air is cold. From the fact of its preserving its warmth so far from its source, the natives have erected many enclosures over the stream at various spots for bathing. The narrow cavern from which it issues is continued some distance into the rock, and is sufficiently high to allow of a man's standing erect in it.

There are several *karezes* in the northern part of the valley, and among the low clay hills to the westward are numerous wells, where water is obtained within a few feet of the surface. Down the center of the valley runs the dry bed of a watercourse, some 50 yards broad, covered with boulders and shingle. After heavy rain in the hills—an occurrence not unusual in summer—a body of water, swelled by innumerable rivulets from the mountains, rushing down the valley, entirely fills this bed and presents a stream 30–50 yards wide and 2–3 feet deep. It rapidly drains off, and 12 hours are usually sufficient for its entire dissipation.

In the southern portion there are a few villages surrounded by orchards. The valley is well cultivated and systematically irrigated, and divided off by ridges of earth into melon beds, fields and gardens. Each field, or enclosure, is so accurately leveled that when irrigated, the water may be evenly distributed and, consequently, the fields form a series of terraces extending throughout the length of the valley. Wheat, barley, *juari,* etc. are largely produced, as also are lucerne grass, turnips, carrots, lettuce, radishes, onions, beetroot, tobacco, eggplant and cucumbers. Potatoes are of very good quality. Melon beds are numerous and in the season this fruit, of which there are many varieties, forms a staple food of the lower classes.

The orchards abound in excellent fruit trees, such as the mulberry, peach, apple, quince, fig, plum and vine.

White and weeping willows fringe the streams, and the white spreading poplar is frequently seen.

Owing to the great elevation, the heat of the summer is not extreme. The heaviest rainfall occurs during July–August. The total annual rainfall is probably not more than 15–16 inches.

The winter, which begins about the end of October and lasts until March, is exceedingly severe. Bitterly cold winds prevail, attended by heavy falls of snow. The frosts are severe and continued. The inhabitants, for the most part, rarely await the arrival of winter, but descend into the mild climate of Kachhi. The Khan and his Court often adjourned to Gandava, and there awaited the return of summer.

Horses and cattle are usually fed on the straw of wheat and barley, and to this is added a certain amount of lucerne grass, either green or dried. Little or no grain is allowed, the lucerne grass being considered sufficiently nourishing.

Firewood is obtained from the superior mountain ranges, which are covered with a species of juniper. It is brought to Kalat on the backs of camels, bullocks and donkeys.

The inhabitants of Kalat Valley include Brahuis, Baluchis, Dehwars and Babis. This Province is the real headquarters of the Brahui nation.

At Nichara, in the eastern hills, there are a few caves and cave temples, religious and sepulchral localities.

Kalat to Kapoto

On April 3 Major Saadullah Khan, Chief of Police in Kalat, informed us that a large cave near Kapoto would be worth investigation for traces of Prehistoric occupation. The following day we left in the Jeep, followed by the Dodge Power Wagon, for Kapoto, where camels and horses were to be obtained for the ride to the cave. Our guide, a young policeman from Kapoto, assured us that the big cave was less than 30 minutes ride from his village.

Our course was due south to the end of the paved road leading into a well-marked track toward a massive hill (300 feet) about one mile ahead. Our road followed a wadi, 20 feet wide and 6 feet deep, which meandered on our left hand. Several shepherds guarded their flocks. The plain (600 yards wide) was covered with low green bushes, some with yellow flowers.

The road, now a single camel track, became extremely rough in low range. We passed to the left of the solitary peak and approached a clearly marked track with a smoother surface. To the right and left ranges of hills (300 feet) enclosed the valley. We passed a hill, pockmarked with eroded holes, on our right. Two low (150 feet) rounded, bush-covered hills lay 200 paces to the right. The track led through a wadi (60 feet) with banks 3–4 feet high. To the right there were signs of former cultivation with 4 terraced enclosures, each about one acre, and plowed furrows. We continued across the open valley flanked by a high range of hills (600 feet).

The well-marked track led across the center of the valley with plowed patches nearby. Above a rocky cliff hovered a hawk (*baz*). To the left stood irrigated areas, probably *gabrbands.* On the right, a limestone outcrop (400 feet) with bulbous formation stood out. To the left many bushes and eroded scars lay in deep shadow. The track crossed a bush-covered plain into the Jahal Valley, past some monster-shaped, bulbous hills (500 feet) on the right. Argillaceous and arenaceous deposits covered the floor of this valley. Two nightingales circled above 2 round buildings to the right.

Opposite were 10 acres of deserted plowed land. Just beyond another 10 acres lay deserted. These were probably *gabrbands.* The track now lay across a muddy area, obviously impassable after rain, covered with myriads of low bushes brown in sunlight. More plowed land was scattered throughout this valley. From far to the right a shepherd boy came running to tell us that we were about 1,000 paces to the left of the Kapoto-Kalat road. Our police escort and guide seemed little concerned with his error.

We drove across very rough plowed land amid bushes to the road and 10 minutes later saw the smoke rising from the mud huts of Little Kapoto just ahead. Driving into this village, we were welcomed by the Rais.

Within an hour, mounted on camels and horses, we started southward for the cave. We were followed by a group of villagers running along on foot.

The camel tracks led across a barren, sandy area between low (200-foot) ranges. Two hours later we reached Kapoto Wells, where our guide conversed energetically with the Big Kapoto villagers regarding the location of the cave. Obviously, the young policeman was no guide to this area.

Rauf Khan produced his map to show that the cave to which they referred was at Nichara at least 7 miles to the east. This was too far to attempt, since we had to be in Kalat before nightfall. I decided to ride on to Big Kapoto and on the way saw a rock shelter dominating a steep-sided slope on the right. We climbed about 60 feet up to this limestone overhang. On the talus I found several small flint flakes indicating human habitation. I decided to return the next day to sink a trial trench.

We rode south around the end of the range until Big Kapoto appeared about 1 mile ahead. This village lay at the southern end of Choori-Burr Mountain facing a broad valley, dotted with low bushes, with 2 ranges (800 feet) converging about 10 miles distant. There were about 40 flat-roofed, mud-brick houses. Our timid police escort recommended that we should not ride across the plain to the village.

We continued, therefore, to skirt the end of the range and proceeded northward back toward Little Kapoto. The ground was strewn with large boulders, some encrusted with small, fossilized shells. The western face of the mountain was mottled brown, craggy and steep, rising to about 700 feet. About 1,000 paces from the southwestern corner of this huge outlier, some caves or rock shelters were visible as black holes in the brown escarpment. Several of these were near the top, probably too inaccessible for the ancient hunters, but possibly serving as lookouts. We rode across to visit 2 rock shelters standing about 100 feet above plain level. Each had an outer wall of small boulders. Inside the ceilings were smoke-blackened and the floor had recent charcoal ashes and sheep dung. Our local guides explained that the shepherds used these rock shelters as places of refuge from sandstorms and rain. No pottery and no flint or chert flakes were found inside the rock shelters nor on the scree slopes. We continued to ride around the mountain and arrived at Little Kapoto at 1700 hours and back in Kalat Rest House 90 minutes later.

Next morning we returned to Little Kapoto at 0800 hours and drove in the Jeep around the western face of the mountain past Big Kapoto to the rock shelter, where we began excavations.

A trial trench (12 x 8 x 3 feet) was sunk from the retaining wall outward to the edge of the cliff. Near the inner wall the earth was only 6 inches deep, but increased gradually as the trench widened. A few broken, plain sherds were unearthed in the upper 12 inches; these were mixed with sheep dung and the evidence of hearths.

About 24 inches deep and 7 feet from the back wall, some flint flakes and several microliths were excavated. The latter were similar to those picked up on the talus. Here was the first direct evidence of Mesolithic occupation in Baluchistan—a link in the chain of evidence ranging from the Iranian Plateau and northern Iraq on the west to the Vindyha Hills in India (fig. 14) on the east. No bones were found. Our locally recruited workmen from Little Kapoto excavated steadily and carefully, although they could see little point to the foreigners picking up charred sherds and every minute flint flake.

The earth was cleared down to bedrock from the back wall to the edge of the ancient talus. It was now midafternoon when 4 men from Big Kapoto climbed the steep slope to see what was happening on their mountainside.

The leader, handsome in bright green turban and sash, ordered my workmen to stop digging. Any explanation was to no avail. This descendant of the Prophet feared we might disturb Moslem bones, which would be defiled by Christian hands or even eyes.

We were forced to discontinue work, for the timid workmen from Little Kapoto were afraid of this imperious command from a village elder of Big Kapoto. We asked this elder if there were any mounds in this valley where pottery lay strewn on the surface. Shading his eyes, he pointed to a mound far down on the plain below. We drove across to Kapoto-Damb and there were rewarded with a rich collection of painted and plain sherds in great quantity. Within an hour we had collected a splendid series, indicating that future excavations should be made here.

We were entertained at dinner in Little Kapoto, the headman having killed an aged goat in our honor. We could not refuse this hospitality although fleas and ticks were numerous on the rugs spread inside the smoke-filled mud hut, which served as the council chamber. Later, I found out that we were in the center of an endemic typhus belt, hence few foreigners had ever visited Kapoto. (For a note on the ticks collected *see* Field, 1957b.)

These villagers were about 5′ 6″, dolichocephalic–mesocephalic, with long narrow faces with relatively light skins, dark brown, low wavy hair and dark brown eyes. Many wore beards and/or mustaches. The nose was straight or convex with medium alae. One man had wide zygomatic arches and light eyes.

In general, they were racially different from the Baluchis, especially from the brachycephalic Rinds. We returned to Kalat at sunset.

KALAT TO QUETTA

On April 6 with the assistance of Major Saadullah Khan, Commissioner of Police, I measured 138 Kalat Police, and Mrs. Field

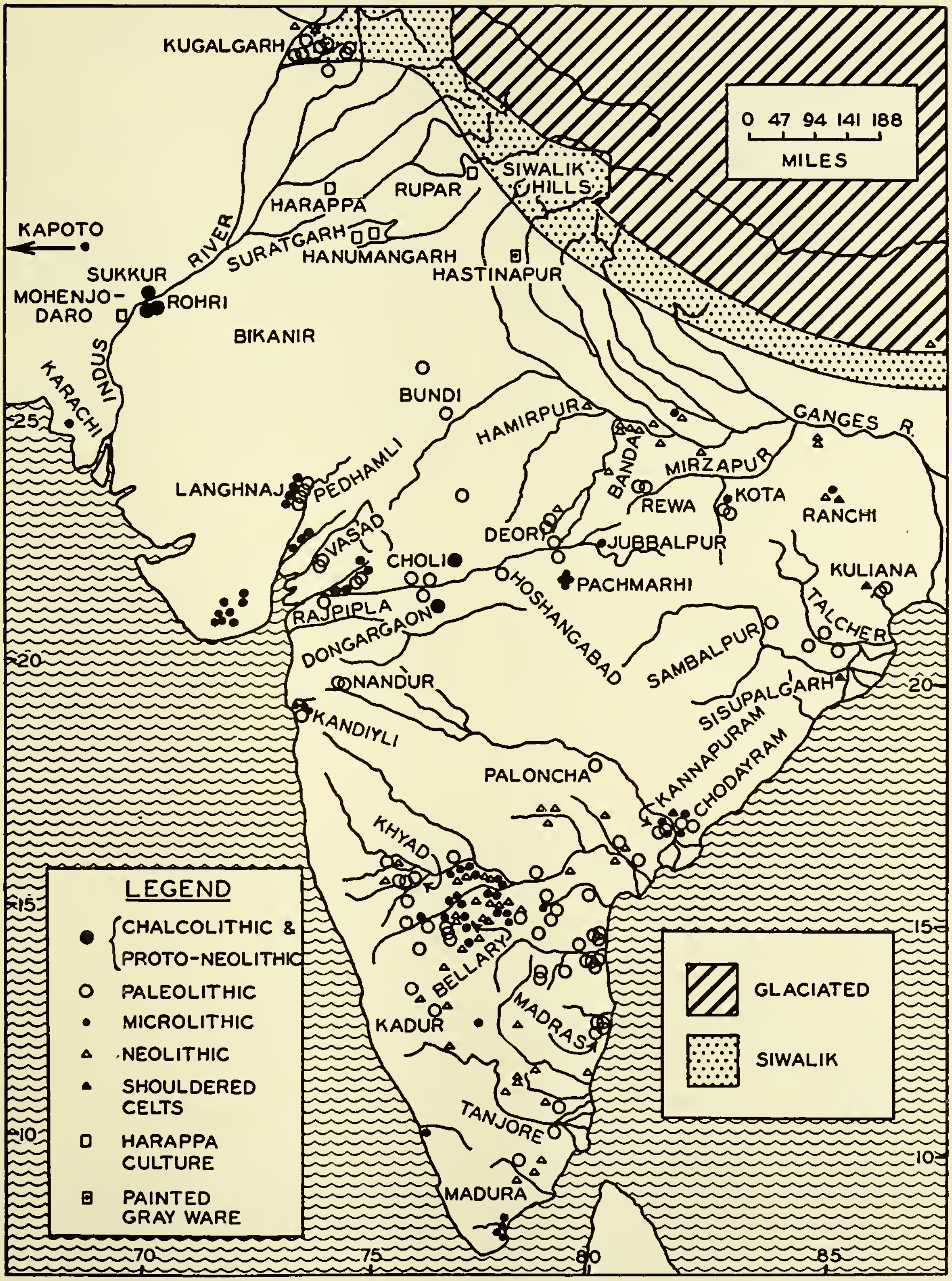

Fig. 14. Selected archæological sites in West Pakistan and India (*after* Sankalia, Subbarao and Deo).

photographed each man front and profile (figs. 113–114). That night we were the guests of Mr. G. N. N. Nunn, United Nations representative in Mastung. His white bungalow stood in the center of a huge garden shaded by large trees (fig. 58). Two typical Brahui knives (fig. 67) were purchased. In the garden Mrs. Field photographed (fig. 68) Hasham with a carpet viper (*Echis carinatus*) crawling up his musical gourd.

On April 7 we reached Quetta, where the Railway Rest House was placed at our disposal by Syed Afzal Ali Shah, Divisional Superintendent of Railways.

At the conclusion of our journey from Pasni to Quetta most of the Expedition members had fever or dysentery. As a result I sent everyone by train to Karachi, except for Mohammed Idris Saddiqi.

On April 11 Major R. S. Saker gave us some painted jars (fig. 69) found at Nushki, due west of Quetta. This site should be examined.

Two days later Idris and I drove to a mound on the eastern side of the wadi about 12 miles south of Quetta; this may be Mian Gundai-Damb or Damb-Saadat. Here in 2 hours we collected a fine series of painted and plain ware. This mound covers several acres and its summit stands about 35 feet above the level of the plain.

On April 15 Mrs. Field, Mohammed Idris Saddiqi, and I left by train for Bahawalpur.

CHAPTER VI

THE PHYSICAL ANTHROPOLOGY OF THE BALUCHIS, BRAHUIS AND MISCELLANEA

IN THE preceding chapters the land and the peoples of Makran and Kalat have been described and a brief summary of historical events in these areas have been given.

ANTHROPOMETRIC METHODS AND TECHNIQUE

In general, the anthropometric methods and technique follow the procedure adopted by the International Committee at Monaco in 1906. A detailed description of the technique has appeared in my "Contributions to the Anthropology of Iran" (Field, 1939, pp. 278–88).

In order to present the statistical tables so that they can be compared to my published data obtained in Iraq, Iran, Syria, the Caucasus, Bahrain and Egypt (Faiyum and Sinai), it will be necessary to group the individuals according to the two classificatory systems devised and adopted by Dr. E. A. Hooton in the Laboratory of Anthropology at Harvard, and by Sir Arthur Keith.

While the general trends remain the same, the greater number of divisions (Keith system) show more clearly any small differences. For the sake of direct comparison, wherever possible, I have grouped the two tables.

Since we are dealing with two main groups, the Baluchis and the Brahuis, special attention will be focused on comparing and contrasting them.

Comparative tables on the anthropometry of Southwestern Asia have been published (Field, 1957a), so that it is necessary here only to refer to them and to draw some deductions.

Hence I am publishing here only the summarized vital statistics, morphological characters and statistical analyses. The raw data have been placed on Microfilm No. 4786, pp. 1–139 and No. 4877, pp. 1–140 in the American Documentation Institute, c/o Photoduplication Service, Library of Congress, where a microfilm copy or an enlargement may be purchased.

The list of abbreviations is given in table 12.

THE BALUCHIS

The 85 Baluchis were recorded at 3 localities: 34 in Turbat (Group A); 38 in Panjgur (Group B); and 13 in Kalat (Group D). Each group has been studied separately.

34 BALUCHIS IN TURBAT (A)

Tribal groups. The following tribes were represented: Bizanjau (Nos. 11, 30); Durazai (Nos. 16, 23, 33); Gichki (No. 8); Kahodai (Nos. 13, 27, 29); Rais (Nos. 2, 5–7, 9, 12, 19, 22, 25, 28, 31, 32); Rind (Nos. 10, 14, 15, 17, 20, 34); Sangur (Nos. 1, 3, 4, 18, 21, 24, 26).

Age (*see* table 13). The mean age for 34 Baluchis in Turbat was 30.12, with a range of 18–45. More than half of the group were between 18–29 years of age; no individual gave his age as more than 49 years.

MORPHOLOGICAL CHARACTERS OF BALUCHIS

Face. Nos. 10, 12, 20 and 30 had triangular faces.

Skin (*see* table 14). The color was darker than the Arabs of the Hilla Liwa in Central Iraq and approximated that of the Southern Shammar Beduins of northern Saudi Arabia or the Beduins of Sinai. Individually, it ranged from that of a South European to dark brown. Exposure to the sun and wind tended to give a weather-beaten complexion. When the head cover was removed, the unexposed part of the head was often as light as that of a South European. Attention must be called to the yellowish skin among one-third of this group (Nos. 9, 11, 14–16, 19, 22, 26, 28, 29, 31, 34). No. 32, slightly bald, had pale skin with a sharp line of sunburn and exposure tan above the forehead.

Negro Blood. No. 3 possessed some degree of Negro blood, rare among these Baluchis.

Mongoloid. Nos. 19, 20, 21, 28 and 29 possessed Mongoloid features, mainly in the straightness of the very dark brown or black hair and wide and prominent zygomatic arches. No. 21 appeared to combine some Negro and Mongoloid features.

Freckles (*see* table 15). Only 3 Baluchis had freckles.

Moles (*see* table 16). Fourteen (42.42 per cent) had moles on the face.

Hair (*see* table 17). The color was uniformly dark brown. One Baluchi had a lighter brown mustache. Low wavy hair predominated, although one-third of this small group had deep waves. One man had frizzly hair. In texture the hair was either medium (57.58 per cent) or fine. The quantity of head hair was pronounced (60.61 per cent) or medium. Body hair was recorded in equal proportions in the absent, sub-medium and medium categories. Three Baluchis were markedly hirsute. Five men had some baldness. Some grayness was recorded in about 40.0 per cent of the group. This is unusual in such a young group.

Eyes (*see* table 18). The majority (69.69 per cent) were dark brown, while the remainder ranged to light brown, perhaps indicating some trace of submerged blondism. The iris was clear with only 5 exceptions. No. 13 had blue-ringed sclera.

Eyebrows (*see* table 19). The eyebrows tended to be small, there being two-thirds of the group in the sub-medium-absent categories. One Baluchi had pronounced eyebrows.

Browridges (*see* table 20). The development was medium (47.06 per cent) or less than normal.

Nose (*see* table 21). The nasal profile revealed considerable variation with 72.72 per cent convex, 15.15 per cent straight and the remainder divided equally between the concave and wavy categories. The nasal tip was medium (51.52 per cent) or sub-medium. However, 4 Baluchis had thick nasal tips and one man was recorded in the very pronounced category. The alae were medium (59.37 per cent) or compressed, except for 3 Baluchis with flaring nasal wings.

Lips (*see* table 22). The eversion was medium (45.45 per cent) or pronounced (36.36 per cent), the remainder being sub-medium.

Teeth (*see* table 23). The occlusion was normal slight overbite (85.71 per cent). Very few teeth had been lost, once again because of the youthfulness of this group. The wear, however, was pronounced in 14 Baluchis, a high percentage and indicating some factor in their diet. This was probably the result of the habit of chewing date pits combined with their eating bread made from grinding wheat with a stone quern. Crowding was absent except in one individual. Eruption was recorded as complete in almost every case. In view of the youthfulness of this group, this percentage is undoubtedly incorrect. No. 4 had good, white teeth, but one was broken. No. 10 had stained teeth, the result of chewing tobacco. No. 17 had excellent white teeth. No. 22 had 2 broken teeth. No. 28 possessed very large teeth. No. 30 had large teeth. Nos. 31–32 had excellent, white teeth.

Ears (*see* table 24). The lobe was either attached or free in almost equal proportions. The lobe size was small (59.84 per cent) or medium. The protrusion was normal with 3 Baluchis being in the pronounced category.

Musculature. No statistical details were recorded. However, the general impression was that these Baluchis observed and measured, as well as the majority seen in Turbat, tended to be well-developed as a result of constant physical work from childhood.

Health. The adult population appeared to be in good health, the result of hard physical labor, a great deal of sunshine and a cold, invigorating winter climate.

Infant Mortality. No statistical data were available. However, I estimate that about 400 per 1,000 die before their first birthday, a figure also estimated for the Beduins of the Arabian Peninsula.

Disease and Injury. No smallpox scars were recorded. No. 5 had a horizontal scar over the right eye, the result of a fight. No. 6 had 2 scars, above glabella and across nasal arch, both from an accident. No. 7 had a scar above left eye caused by a fall from a horse. No. 8 had a large cataract in the left eye and a small cataract in the right eye.

Anomalies. None were recorded.

Photographic Analyses

The Baluchis measured, observed and photographed at Turbat (figs. 97–103) reveal racial links with the peoples of southeastern Iran and the Iranian Plateau. There is considerable variation in facial form from the narrow, long-faced type (No. 14) to the more general broad, short-faced type (No. 23). The lips ranged from thin (No. 19) to full and everted (No. 15). The hair was abundant, especially on Nos. 17, 24 and 31. The nasal profile ranged from convex (Nos. 14 and 15) to concave (No. 31). The 4 men on figure 103 have been grouped as aberrant types: Nos. 29 and 20 as exhibiting Mongoloid traits; No. 21, Negroid; and No. 34 Western European.

Summary

The average Baluchi of Turbat possessed a brunet or swarthy skin, dark brown hair, low or deep wavy in form and medium in texture, dark brown eyes with clear irises, a convex nasal profile with medium or sub-medium alae, good teeth with normal slight overbite, well-developed musculature and appeared to be in good health.

Statistical Analyses of Baluchis

Stature (*see* table 25). The mean was 164.5, range 156.2–191.4. The threefold Harvard classificatory system reveals that the majority (61.76 per cent) were of medium (160.6–169.4) category, the remainder being either equally divided between the short (23.53 per cent) and tall divisions. The Keith system places 76.47 per cent in the medium (160.6–169.4) category, the remainder being either short or tall. No individual was in the very tall (180.0–X) category. Despite the degree of variability, the mean stature of these Baluchis falls slightly below the theoretical mean of the peoples of Southwestern Asia. Since the 38 Baluchis measured in Panjgur were 171.56 and the 13 in Kalat 168.23, I believe that the low stature recorded in Turbat is the result of the smallness of the sample.

Sitting Height (*see* table 26). The mean was 83.81, range 76.2–91.4. The majority (58.82 per cent) possessed long (85.0–89.9) trunks, but 32.35 per cent were in the medium (80.0–84.9) category. Two Baluchis were in the very long group and one in the short division.

Head Measurements and Indices (*see* table 27). For the minimum frontal diameter the mean was 111.62, range 102–127. The majority (67.65 per cent) of the foreheads were wide (110–119), but 29.41 per cent were narrow (100–109). The mean head breadth was 143.94, range 135–160. Eighteen Baluchis (52.94 per cent) possessed wide (140–149) heads, the next largest group (32.35 per cent) being narrow (130–139). Five men (14.71 per cent) had very wide (150–X heads). No Baluchi had a very narrow (120–129) head. The mean head length was 176.12, range 164–194. The mean cephalic index was 81.88, range 73–89. On the basis of the Harvard system, 52.94 per cent were mesocephalic (76.6–82.5), the next largest group (35.29 per cent) being brachycephalic (82.6–X). There were 4 dolichocephals (X–76.5).

The fivefold Keith division reveals a more significant series of groupings. The largest number (41.18 per cent) were brachycephalic (80.0–84.9) with 10 Baluchis (29.41 per cent) ultrabrachycephalic (85.0–X). Eight Baluchis (23.53 per cent) were mesocephalic (75.1–79.9) and 2 were dolichocephalic (70.1–75.0). There were no ultradolichocephals (X–70.0).

Facial Measurements and Indices (*see* table 28). The mean upper facial height was 72.85, range 65–79. The largest group (44.12 per cent) possessed medium long (70–75) upper faces, 32.35 per cent were long (76–X) with 23.53 per cent in the medium short (64–69) category. No Baluchi possessed a short (X–63) upper face. The mean upper facial index was 56.03, range 50–69. The mean total facial height was 119.29, range 108–129. The majority (55.88 per cent) possessed medium short (110–119) faces, the next highest group (41.18 per cent) being medium long (120–129). One Baluchi had a short (X–109) face. No individual was recorded in the long (X–130) category. The mean total facial index was 91.71, range 84–109. The majority (61.76 per cent) were leptoprosopic (89.5–X), the next largest group (32.35 per cent) being mesoprosopic (84.6–89.4). Two Baluchis were euryprosopic (X–84.5).

The mean bizygomatic breadth was 130.26, range 113–142. The mean bigonial breadth was 105.55, range 96–118. The latter appears unusually narrow, possibly the result of such a small series.

Nasal Measurements and Indices (*see* table 29). The mean nasal height was 53.2, range 45–62. The majority (73.53 per cent) were medium (50–59), with an almost equal number in the short (X–49) and long (60–X) categories.

In breadth the mean was 35.2, range 24–42. The majority (55.88 per cent) were medium wide (36–41), the next largest group (38.24 per cent) being medium narrow (30–35). There was one Baluchi in the very narrow (X–29) and one in the wide (42–X) categories.

The mean nasal index was 66.71, range 48–89. The majority (64.71 per cent) were leptorrhine (X–67.4), the next largest group (32.35 per cent) being mesorrhine (67.5–83.4). Only one Baluchi was platyrrhine (83.5–X).

Statistical Analyses (*see* table 30). The groupings for head breadth and minimum frontal diameter, for total facial height and bizygomatic diameter, for total and upper facial heights and for nasal height and breadth are given in tabular form.

Measurements and Indices (*see* table 31). The number of individuals, range, mean, standard deviation and coefficient of variation are given in a standard table for direct comparison with my other published anthropometric data recorded in Southwestern Asia.

Summary

The average Baluchi of Turbat is medium in stature, long to medium in trunk length, and possesses a wide forehead, a wide head, a brachycephalic tending toward ultrabrachycephalic index, medium long to long upper facial height, medium short to medium long total facial height with a leptoprosopic index, a nose medium in length, medium wide or medium narrow, and a leptorrhine to mesorrhine index.

38 BALUCHIS IN PANJGUR (B)

Tribal Groups. The only tribes represented were the Rais (Nos. 1–34, 102 and 103) and Rind (Nos. 96 and 97).

Age (*see* table 32). The mean age for 38 Baluchis in Panjgur was 26.39, range 19–40. Almost three-quarters of this series were under 30 years old.

Morphological Characters of Baluchis

Face. No. 16 had a triangular face.

Skin (*see* table 33). The color was mainly brunet, with one-third in the swarthy category. The skin color of the exposed parts of the head resembled that of the Beduins of the North Arabian Peninsula, including Sinai. This tanned and weather-beaten complexion results from exposure to the sun and the frequent wind and sandstorms. The unexposed portion of the forehead and head is considerably lighter in color. This was recorded on Nos. 16 and 23. Nos. 28, 32, 34 and 96 had a pinkish-white complexion, similar to that of northern Europeans.

Negro Blood. Nos. 7 and 26 possessed some degree of Negro blood, rare among the Baluchis.

Mongoloid. No trace of Mongoloid blood was seen. Four Baluchis in Turbat were thus described. No individual had yellowish skin, although 12 out of 34 Baluchis in Turbat possessed this character.

Freckles (*see* table 34). Almost one-third of the group had freckles.

Moles (*see* table 35). More than half of these Baluchis had moles on the face.

Hair (*see* table 36). The color of the head hair, beard or mustache was uniformly dark brown. Low wavy hair predominated although about one-third of the group had deep waves. One man had curly hair. The texture was medium (65.79 per cent), the remainder being equally divided into the fine and coarse categories. The quantity of head hair was medium (69.23 per cent) or pronounced. Baldness and grayness were absent because of the youth of this small group.

Eyes (*see* table 37). The majority (89.47 per cent) were dark brown. Two Baluchis had light brown or green-brown eyes, indicating an element of submerged blondism. The iris was almost uniformly clear. Blue-ringed sclera were recorded on Nos. 6, 18, 21 and 30. No. 26 had bloodshot eyes.

Nose (*see* table 38). The nasal profile revealed considerable variation with 68.42 per cent convex and 18.42 per cent straight. There were 3 Baluchis with concave and 2 with wavy noses. The nasal tip was medium (63.16 per cent) or sub-medium (28.95 per cent). Three Baluchis had pronounced thick nasal tips. The alae were medium (65.79 per cent), the remainder being compressed.

Teeth (*see* table 39). The occlusion was normal slight overbite (81.48 per cent). Half of the group had lost some teeth, the majority none. Considerably more wear was recorded than would have been anticipated for such a youthful group. There was only 1 case (No. 2) of crowding with teeth out of line. Eruption was equally divided between complete and partial. Excellent, white teeth were recorded on Nos. 1, 11, 17 and 32. No. 18 had yellow teeth.

Lips (*see* table 40). The eversion was medium, although 8 Baluchis were in the pronounced category. Although only 14 men were recorded, the remainder possessed medium everted lips.

Ears (*see* table 41). The lobes were attached (94.74 per cent). Two Baluchis had soldered lobes. The size was sub-medium (73.68 per cent). Nine men had medium lobes. The protrusion was medium (72.97 per cent). Three Baluchis had pronounced protrusion.

Musculature. No statistics were recorded. The general impression was that this series as well as the majority of the Baluchis in Panjgur were well-developed.

Health. The adult population seemed to be in good health, although the local doctor recorded numerous cases of tuberculosis, dysentery and malaria.

Infant Mortality. No statistics were available. The best estimate is 400 per 1,000 deaths prior to the first birthday, with slightly higher percentage of male mortality.

Disease and Injury. No. 96 had scars on the right cheek.

Anomalies. None were recorded.

PHOTOGRAPHIC ANALYSES

The Baluchis measured, observed and photographed at Panjgur (figs. 104–12) reveal racial links with Iran and the West, rather than with the peoples across the Indus into India. There is considerable variation in facial from the long, narrow-faced type (No. 96) to the short, broad-faced type (No. 30). The lips ranged from thin (No. 20) to thick everted (No. 8). Some Baluchis showed alveolar prognathism (No. 7). The nose ranged from convex (No. 1) to concave (No. 13). The hair was abundant, especially on Nos. 14, 29 and 27. Only one Baluchi (No. 3) would pass for a Western European.

SUMMARY

The average Baluchi of Panjgur possessed a brunet or swarthy skin, dark brown hair, low or deep wavy in form and medium in texture, dark brown eyes with clear iris, a convex nose with medium tip thickness and medium or compressed alae, good teeth with normal slight overbite, well-developed musculature and good health.

STATISTICAL ANALYSES OF BALUCHIS

Stature (*see* table 42). The mean was 171.6, range 162.6–182.9. The two classificatory systems (table 32) reveal the following groupings. The threefold Harvard system places an almost equal number in the tall (169.5–X) and medium (160.6–169.4) divisions with 2 short Baluchis (5.41 per cent). The fourfold Keith system places 57.89 per cent in the tall (170.0–179.9) category with 3 very tall Baluchis (7.89 per cent). The remainder were medium tall (160.0–169.9).

Relative Sitting Height (*see* table 43). The mean was 50.53, range 47–58. The majority (68.42 per cent) were long (85.0–89.9) with 6 Baluchis in the medium (80.0–84.9) and very long (90.0–X) categories. There were no short or very short trunk lengths.

Head Measurements and Indices (*see* table 44). For the minimum frontal diameter the mean was 112.32, range 103–123. The majority (62.16 per cent) of the foreheads were wide (110–119), the next largest group (32.43 per cent) being narrow (100–109). Two Baluchis had very wide (120–X) foreheads. The mean head breadth was 147.89, range 134–159. In this measurement there was considerable variation. The largest group (40.54 per cent) possessed very wide (150–X) heads, the next largest series (32.43 per cent) being narrow (130–139). The remaining 10 Baluchis had wide (140–149) heads. No Baluchi had a very narrow (120–129) head. The mean head length was 179.19, range 165–197.

The mean cephalic index was 82.65, range 74.93. The threefold Harvard system reveals an almost equal grouping in the mesocephalic and brachycephalic (82.6–X) divisions. Two Baluchis were dolichocephalic. The fivefold Keith system places the majority (51.35 per cent) in the mesocephalic (75.1–79.9 per cent) category, the next largest group (29.75 per cent) being brachycephalic. There was no ultrabrachycephal (85.0–X). Six of the Baluchis (16.22 per cent) were dolichocephalic (70.1–75.0). There was one ultradolichocephalic Baluchi.

Facial Measurements and Indices (*see* table 45). The mean upper facial height was 73.81, range 62.85. The largest group (48.65 per cent) possessed long (76–X) upper faces with an equal number (9) in the medium short (64–69) or medium long (70–75) categories. One Baluchi had a short (X–63) upper face. The mean upper facial index was 55.81, range 48–63.

The mean total facial height was 124.76, range 107–142. The majority (56.76 per cent) possessed medium long (120–129) faces with an almost equal number (20.0 per cent) in the long (130–X) and medium short (120–129) categories. One Baluchi had a short (X–109) face.

The mean total facial index was 94.19, range 83–104. The majority (81.08 per cent) were leptoprosopic (89.5–X), the remainder being about equally divided between the mesoprosopic and euryprosopic (X–84.5) divisions.

Nasal Measurements and Indices (*see* table 46). In breadth the mean was 37.0, range 33–44. The majority (78.38 per cent) were medium wide (38–41), the next largest group (18.92 per cent) being medium narrow (30–35). One Baluchi possessed a wide (42–X) nose. None were in the very narrow (X–29) category. The mean nasal height was 54.41, range 44–67. The majority (81.08 per cent) were medium (50–59) in length. An almost equal number possessed either short or long noses.

The mean nasal index was 68.43, range 57–84. The majority were leptorrhine (X–67.4), the remainder being mesorrhine (67.5–83.4). No Baluchi was platyrrhine.

Statistical Analyses (*see* table 47). The groupings for head breadth and minimum frontal diameter, for total facial height and bizygomatic diameter, for total and upper facial heights and for nasal height and breadth are given in tabular form.

Measurements and Indices (*see* table 48). The number of individuals, range, mean, standard deviation and coefficient of variation are given in a standard table for direct comparison with my published anthropometric data recorded in Southwestern Asia.

SUMMARY

The average Baluchi of Panjgur is tall or medium, long in trunk length, and possesses a wide forehead, a very wide or wide head, a mesocephalic tending toward brachycephalic index, long upper facial height, medium long total facial height with a leptoprosopic index, a nose medium in length, medium wide and a leptorrhine index.

13 BALUCHIS IN KALAT (D)

Tribal Groups. The following tribes were represented: Musiani (No. 70); Rakhshani (No. 78); Mullazai (No. 84); Durazai (No. 85); Omezai (No. 86); Khalanzai (No. 88); Rind (Nos. 89, 99); Rind Musazai (No. 90); Kehrazai (No. 107); Singozai (No. 108); Rais (No. 111); and Kambarani (No. 112).

Observations and Measurements (*see* tables 68–74). Since this group is so small, full analysis has not been given.

Age (*see* table 66). The mean age for 13 Baluchis was 29.2, range 20–45.

MORPHOLOGICAL CHARACTERS OF BALUCHIS

Skin (*see* table 68). The color was swarthy or brunet, similar to that of other Baluchi groups observed.

Negro Blood. Nos. 85, 86, 99 and 114 possessed some degree of Negro blood. This is a high percentage among this small series of 13 Baluchis.

Mongoloid. No individual had characteristic Mongoloid features, although Nos. 88 and 107 had yellowish skin color.

Hair (*see* table 71). The hair was dark brown with low waves and medium in texture. The eyes were dark brown with clear irises. The nasal profile was straight with an almost equal number in the concave and convex categories. The alae were medium.

Kohl. This had been applied under the eyes by Nos. 85 and 111 "to reduce the glare from the sun."

Photographic Analyses

The Baluchis measured, observed and photographed at Kalat (figs. 113–14) showed no special racial characters differentiating them from the Baluchis of Panjgur and Kalat, with the possible exception of No. 85, whose profile seemed unusual for this series.

Statistical Analyses of Baluchis

Stature (*see* table 75). The mean was 168.2, range 157.5–177.8. In both the Harvard and Keith categories the majority were either tall or medium.

Weight (*see* table 67). The mean was 130.5, range 106–160.

Head Measurements and Indices (*see* table 76). The head breadth was narrow or wide. The minimum frontal diameter was narrow. The mean cephalic index was 77.8, range 72–84, with a wide range of distribution.

Facial Measurements and Indices (*see* table 77). The mean upper facial height was 68.0, range 61–73, with a wide range of distribution. The mean total facial height was 120.0, range 103–132, the majority being medium long (120–129). The mean total facial index was 92.8, range 85–101, with the majority leptoprosopic.

Nasal Measurements and Indices (*see* table 78). The mean nasal height was 49.9, range 41–57. The breadth was 36.5, range 33–39. The index was 74.7, range 63–90. In groupings the nose was medium in length, medium wide or medium narrow, with a mesorrhine index.

Measurements and Indices (*see* table 79). This standard table has been prepared for direct comparison with our other Baluchi groups (A and B).

THE BRAHUIS

The 151 Brahuis were examined as follows: 65 in Panjgur (Group C), and 86 in Kalat (Group E). These have been studied separately.

65 BRAHUIS IN PANJGUR (C)

Tribal Groups. The following tribes were represented: Bungulzai (Nos. 38, 49, 50, 65, 67, 68, 70, 72, 74, 78, 82–84, 86, 88–91, 94, 95, 99 and 101); Mengalzai (Nos. 35, 43, 48, 54, 55, 59, 62, 63, 66, 69, 73 and 81); Musiani (Nos. 36, 37, 44, 61, 64, 79, 85, 87, 98 and 100); Sumulari (Nos. 39–42, 45–47, 51–53, 56–77, 80, 92 and 93); and Shahwani (No. 60).

Age (*see* table 49). The mean was 21.49, range 18–36. About half of the group was 18 years of age. No Brahui was more than 36 years old.

Morphological Characters of Brahuis

Face. No. 45 had a triangular face.

Skin (*see* table 50). The color was brunet or swarthy and tended to be slightly darker than that of the Baluchis. Individually, the skin color ranged from that of a central European to the swarthy of a South Italian. Exposure to the vagaries of the weather, especially the wind and sand, accounted for the weather-beaten skin color and rough texture. When the head cover was removed, the unexposed part of the head was sometimes seen to be as light as that of Europeans; this was observed on Nos. 92 and 94. The complexion was recorded as pinkish on Nos. 50–53, 58–60, 67, 69, 72, 75, 80, 81, 89, 91, 96 and 100. There were no traces of the yellowish skin recorded among the Baluchis of Turbat.

Negro Blood. None were observed in this series.

Mongoloid. No. 80 possessed some Mongoloid features.

Freckles (*see* table 51). About half of the series had freckles.

Moles (*see* table 52). Nearly three-quarters of the group had moles on the face.

Hair (*see* table 53). The color was uniformly dark brown. Low wavy hair predominated, although about 10.0 per cent possessed deep waves. The texture was medium (83.08 per cent) or fine. Three Brahuis had coarse hair. Baldness was absent, except in one case. The youthfulness of this group undoubtedly accounted for this absence.

Eyes (*see* table 54). The color was dark brown (92.31 per cent). Four Brahuis had light brown and one green-brown eyes. This indicated an element of submerged blondism. The iris was clear (93.85 per cent) or spotted.

Nose (*see* table 55). The nasal profile revealed considerable variation with half of the group possessing convex noses, 26.56 per cent concave, 21.88 per cent straight and one Brahui with a wavy profile. No. 37 had a high spring of the nasal arch. The tip thickness was submedium (69.23 per cent) or medium (29.23 per cent); one Brahui had a markedly thick nasal tip. The alae were equally divided between medium and compressed.

Lips (*see* table 56). Half of the 28 Brahuis recorded had pronounced lip eversion. Two men had very pronounced eversion.

Teeth (*see* table 57). The majority (83.33 per cent) had normal overbite. As anticipated in such a young group, only 5 Brahuis had lost any teeth. However, the wear was considerably more than normal. Seven Brahuis had pronounced wear. No. 56 had jagged wear, especially on the lower teeth. No. 71 had much wear. This must result from the use of the quern in preparing bread. Eight Brahuis had some degree of crowding. Eruption was complete in half of the group. Nos. 41, 44, 48, 55, 58, 61, 72, 77, 79, 89 and 90 had excellent, white teeth. Nos. 56, 70, 75, 81, 84, 93, 95 and 103 had stained teeth. Two Brahuis made comments on their diet: a Mengalzai stated, "We do not eat dates at home," and a Musiani observed that in his tribe tea sweetened with cane sugar is drunk twice daily.

Ears (*see* table 58). The lobe was attached in every case. The size tended to be small. Protrusion was normal (70.77 per cent) or small. Three Brahuis had pronounced protrusion.

Musculature. No statistical details were recorded. However, the general impression was that the Brahuis were well-developed. Since this group had been selected for military service, the less fit would not be included.

Health. This selected group appeared to be in good health.

Disease and Injury. No. 37 had a scar on the right cheek. No. 42 was blind in the left eye, the result of an accident at 8 years of age. No. 44 had a cataract in the left eye. No. 71 had a scar below the mouth on the left side. No. 78 had a scar across the forehead from fighting. No. 82 had a circular scar beside the left eye. No. 88 had smallpox when a child. No. 94 had a pink spot in the center of the right cheek. No. 96 had scars on the right cheek.

Deformation. No. 45 had artificial cranial deformation.

Tattooing. No. 47 was tattooed (Brahui *khal*).

Branding. No. 99 had a branded spot at bregma.

Kohl. In order to protect the eyes from the glare, Nos. 46, 47, 54, 56, 57, 60–62, 64, 67–69, 71, 74–77, 79, 80–88, 90–93 and 100 had applied kohl (Brahui *surmeh;* also Arabic) around the eyes, mainly below.

Anomalies. None were recorded.

PHOTOGRAPHIC ANALYSES

The Brahuis measured, observed and photographed at Panjgur (figs. 117–27) ranged from short, broad faces (No. 59) to ovoid (No. 56). The majority possessed short and broad faces. The wide zygomatic arches (No. 81) and the high, protruding malars (No. 88) sometimes combined with other Mongoloid features (Nos. 53, 63 and 70) indicate a racial element from Central Asia. No. 101 appeared to possess Negroid characters. There were fewer markedly convex noses (No. 71) among these Brahuis than among the Baluchis. The lips ranged from thin (No. 38) to thick and everted (No. 66).

SUMMARY

The average Brahui of Panjgur possessed a brunet or swarthy skin, dark brown hair, low wavy hair and medium in texture, dark brown eyes with clear irises, a convex nasal profile with thin alae, good teeth with normal occlusion, average musculature, and appeared to be in good health.

STATISTICAL ANALYSES OF BRAHUIS

Stature (*see* table 59). The mean was 1706.4, range 1588–1816. The threefold Harvard system places the majority (55.38 per cent) in the tall (169.5–X) category. Three Brahuis were short (X–160.5). The Keith classificatory system groups 34 Brahuis (52.31 per cent) in the tall (170.0–179.9) category, the remainder being medium tall (160.0–169.9) except for 1 short and 2 very tall men. Since this was a military group, they were drilled to stand straight.

Sitting Height (*see* table 60). The mean was 853.57, range 775–914. The majority (69.23 per cent) possessed long (85.0–89.9) trunk lengths, the next highest group (23.08 per cent) being medium (80.0–84.9), which seems to be average for the peoples of this area. No Brahui had a very short (X–74.9) trunk length.

Head Measurements and Indices (*see* table 61). The mean minimum frontal diameter was 112.9, range 107–122. The majority (76.9 per cent) were wide (110–119), but all except one man had narrow (100–109) foreheads. The mean head breadth was 143.1, range 132–156. The majority (53.85 per cent) of the heads were wide (140–149), but one-third were narrow (130–139). Seven Brahuis had very wide (150–X) heads. One man had a very narrow (120–129) head. The mean head length was 181.1, range 168–190.

The mean cephalic index was 79.0, range 72–87. The threefold Harvard system places half of the group in the mesocephalic (76.6–82.5) category. There was almost an equal number in the dolichocephalic (X–76.5) and brachycephalic (82.6–X) divisions. The fivefold Keith system places 28 Brahuis (43.08 per cent) as brachycephalic (80.0–84.9), and an equal number in the mesocephalic (75.1–79.9) and dolichocephalic (70.1–75.0) categories. Five Brahuis were ultrabrachycephalic (85.0–X).

Facial Measurements and Indices (*see* table 62). The mean upper facial height was 69.7, range 59–78. The largest number (35.38 per cent) were medium short (64–69), the next largest (29.23 per cent) being medium long (70–75) and one-fifth of the series in the long (76–X) category. There was considerably less variation in the total facial height. The mean was 69.7, range 59–78. An equal number appeared in the medium long (120–129) and medium short (110–119) categories. Three Brahuis had short and 2 long faces. Half of the group were leptoprosopic (89.5–X), the next largest series (40.0 per cent) being mesoprosopic. Six Brahuis (9.23 per cent) were euryprosopic (X–84.0).

The mean bizygomatic breadth was 133.1, range 123–143. The bigonial breadth was 109.4, range 98–120.

Nasal Measurements and Indices (*see* table 63). The mean nasal height was 51.1, range 42–60. The majority (66.15 per cent) were medium (50–59), the next largest group being short. One Brahui had a long nose (60–X). The mean nasal breadth was 35.8, range 29–42. The majority (67.69 per cent) of the alae were medium wide (36–41) or medium narrow (27.69 per cent). Two Brahuis possessed wide alae and one was in the narrow (X–29) category.

The mean nasal index was 70.4, range 57–89. The majority (52.31 per cent) were mesorrhine (67.5–83.4), the next largest group (44.62 per cent) being leptorrhine. Two Brahuis were platyrrhine (83.5–X).

Statistical Analyses (*see* table 64). The groupings for head breadth and minimum frontal diameter, for total facial height and bizygomatic diameter, for total and upper facial heights and for nasal height and breadth are given in tabular form.

Measurements and Indices (*see* table 65). The number of individuals, range, mean, standard deviation and coefficient of variation are given in a standard table for direct comparison with my other published anthropometric data recorded in Southwestern Asia.

Summary

The average Brahui of Panjgur is tall, long in trunk length and possesses a wide forehead, a wide head, a brachycephalic index, a variable upper facial height, a medium long to medium short total facial height with a leptoprosopic index, a nose medium in length and width with a mesorrhine index.

86 BRAHUIS OF KALAT (E)

Tribal Groups. The tribes represented were as follows: Ahmadzai (No. 18); Bungulzai (Nos. 48, 55 and 67); Gohranzai (Nos. 35 and 93); Gurgnari (Nos. 8 and 11); Hajizai (Nos. 64 and 68); Iltazai (Nos. 57, 60 and 65); Kalandrari (No. 131); Kambarani (No. 112); Khaskhali (No. 137); Mohad. Hasni (Nos. 9, 13, 38, 39, 91 and 94); Rasdani (No. 40); Rohdini (Nos. 123 and 128); Roseni (No. 15); Runja (Nos. 132–36); Sasoli (Nos. 22, 30, 45, 54 and 63); Shahwani (Nos. 51, 61, 74, 79, 96, 105, 106 and 109); Sumulari (Nos. 14, 17, 26 and 41–43); Sumatari Kasimzai (No. 12);

Umerrari (No. 21); and Zahri (Nos. 10, 47, 59, 75 and 80). In addition, the following sections of the large Mengal tribe (Nos. 19, 20 and 23) were represented: Alizai (No. 138); Amirzai (Nos. 1–6); Chandazai (No. 54); Gohrani (No. 36); Khidrari (No. 28); Khiazai (Nos. 52 and 72); Sarpara (Nos. 27, 29, 33, 37, 44, 46, 49, 52 and 102); Trasizai (Nos. 7, 16, 24, 25 and 62); Zagar (Nos. 31, 32, 34, 73, 92 and 101); and Zard (No. 110).

Age (*see* table 80). The mean was 28.8, range 18–44. The series divides about equally into 3 groups: 18–24; 25–34; and 35–44. Three Baluchis were 45 years old.

Weight (*see* table 81). The mean was 126.37 pounds, range 101–190. The largest number (42.35 per cent) weighed 121–130, the next largest series (18.0 per cent) weighing either 111–120 or 131–140 pounds.

MORPHOLOGICAL CHARACTERS OF BRAHUIS

Face. No. 61 had a triangular face.

Skin (*see* table 82). The color was brunet with one-third in the swarthy division. The skin was approximately the same dark brown color as that of the Brahuis of Panjgur and the Baluchis in general. However, the unexposed part of the head tended to be considerably lighter. For example, Nos. 7, 22, 48 and 55 had a light skin color under their protective woolen hats; this contrasted markedly with the exposed part of the face and neck. The complexion was recorded as pinkish on Nos. 10, 23, 35, 46, 47, 53, 105 and 109. No. 109, a Shahwani, could pass for a European.

Negro Blood. Nos. 52, 96 and 137 possessed some degree of Negro blood. This seemed rare among the Brahuis.

Mongoloid. Nos. 29 (from near the Afghan border), 35, 36 (with thick lips), 38 (with yellowish skin), 54, 65 and 91 possessed Mongoloid features, mainly in the wide and prominent zygomata. Attention must also be called to the yellowish skin observed on Nos. 20, 24, 38 and 61.

Freckles (*see* table 83). Half of the series had freckles.

Moles (*see* table 84). About 40.0 per cent had moles on the face.

Hair (*see* table 85). The color was uniformly dark brown, with one lighter brown exception. Two Brahuis had golden brown mustaches, indicating a trace of submerged blondism. The majority (80.72 per cent) had low waves, the remainder deep wavy hair. The texture was medium (64.71 per cent) or fine (28.24 per cent). Six Brahuis had coarse hair. Head hair quantity was average. The beard or mustache tended to be average or less. Grayness of the head or beard was present in about one-third of the group, a rather high percentage for such a young series. No. 72 had hair growing low on his forehead.

Eyes (*see* table 86). The majority (80.23 per cent) were dark brown. Submerged blondism was recorded as light brown (11), dark-light brown (2) and green-brown (2) eyes. One Baluchi had gray-blue eyes. No. 47 commented that "although my parents have blue eyes, they are very rare among Brahuis." No. 48 stated that his father (and others in the Bungulzai tribe) have mixed eyes. The iris was clear (75.0 per cent), the next largest group (19.05 per cent) being spotted.

Nose (*see* table 87). The majority (60.47 per cent) were convex with an almost equal division between the concave and straight categories. The nasal tip was sub-medium (53.49 per cent) or medium (37.21 per cent). Six Brahuis had pronounced and 2 very pronounced nasal tip thickness. The alae were medium (55.81 per cent) or compressed. Four Brahuis had flaring nostrils. No. 62 had a perforated nasal septum.

Teeth (*see* table 88). The majority had normal occlusion, 3 Brahuis being recorded with a marked overbite. Nine men had lost a few teeth. Wear was pronounced on 9 Brahuis, again the result of diet. Crowding was recorded only on one individual. Eruption was complete in 64.52 per cent. Few men had lost any teeth. The following notes were recorded: Nos. 1 and 19, excellent, regular teeth; No. 5, teeth evenly spaced in front; No. 40, good teeth; and No. 56, teeth stained.

Ears (*see* table 89). The majority (93.35 per cent) had attached lobes. The size tended to be small. Protrusion was average or less.

Musculature. No data were recorded. The general impression was that these Brahuis, as well as those seen in Panjgur, tended to be well developed.

Health. The adult population appeared to be in good health, the result of physical labor, considerable sunshine and a cold, invigorating climate during many months of the year.

Disease and Injury. No. 15 had smallpox scars on his face. The following had scars: No. 36, left cheek; No. 74, right cheek; No. 44 above nasion; No. 53 on nose, resembling smallpox; No. 132 from boil on right cheek; No. 135 from boil on nasal tip. No. 73 had 2 large warts on the right cheek. No. 92 had a mole on the right cheek under his eye.

Tattooing. The following were recorded: Nos. 5, 24, 49, on nasion. Two men stated that the tattooing was against the Evil Eye.

Kohl. Nos. 16, 20, 21, 23, 25, 27–29, 33, 36, 37, 43, 45, 47–49, 54, 72, 91, 93, 96, 103 and 131 had applied kohl below the eyes to mitigate the glare from the sun.

Anomalies. None were recorded.

Photographic Analyses

The Brahuis measured, observed and photographed at Kalat (figs. 128–44) ranged from short, broad faces (Nos. 92, 38, 34 and 13) to long, narrow (No. 61). The majority possessed short and broad faces. The wide zygomatic arches and large masseter muscles (Nos. 38 and 67) do not always suggest a Mongoloid type. However, the short, wide face and eyes of Nos. 19, 27 and 36 indicate Mongoloid characters. No. 68 had Negroid blood. A few Brahuis (Nos. 92, 57, 47 and 54) would pass for Western Europeans. This excellent series of photographs illustrates the fact that the racial links are toward Iran and Afghanistan rather than toward the Indus Valley and northern India.

Summary

The average Brahui of Kalat possessed a brunet or swarthy skin, dark brown hair, low wavy in form and medium in texture, dark brown eyes with clear irises, a convex nasal profile with average to small alae, good teeth with normal occlusion, well-developed musculature and appeared to be in good health.

Statistical Analyses of Brahuis

Stature (*see* table 90). The mean was 169.4, range 147.3–185.4. The threefold Harvard system places half of the group in the tall (169.5–X) category, the next largest series (41.18 per cent) being medium (160.6–169.4). Six Brahuis were short (X–160.5). According to the fourfold Keith system, the majority were either tall (170.0–179.9) or medium (160.0–169.9) with 4 Brahuis in the short (X–159.9) and very tall (180.0–X) categories.

Head Measurements and Indices (*see* table 91). For the minimum frontal diameter the mean was 112.0, range 102–130. The majority (60.47 per cent) were wide (110–119), the next largest series (33.72 per cent) being narrow (100–109). Five Brahuis possessed very wide (120–X) foreheads. The mean head breadth was 141.0, range 124–162. The largest groups (47.67 per cent) were wide (140–149) or narrow (40.70 per cent). Six Brahuis had very wide (150–X) and 4 very narrow (120–129) heads. The mean head length was 183.3, range 168–196.

The mean cephalic index was 77.1, range 69–88. According to the threefold Harvard system, there was an equal division (45.35 per cent) between the mesocephalic (76.7–82.5) and dolichocephalic (X–76.5) categories. Eight Brahuis were brachycephalic (82.6–X). The fivefold Keith system reveals a slightly different grouping. The two largest series (33.0–35.0 per cent) were mesocephalic (75.1–79.9) and dolichocephalic (70.1–75.0). However, there were 19 (22.09 per cent) brachycephals (80.0–84.9) and 5 ultrabrachycephals (85.0–X).

Facial Measurements and Indices (*see* table 92). The mean upper facial height was 71.7, range 62–83. The largest grouping (37.21 per cent) was medium long (70–75), the next largest (30.23 per cent) being long (76–X). Nineteen Brahuis (22.09 per cent) were medium short (64–69), the remainder being short (X–63).

The mean total facial height was 122.7, range 108–137. The majority (51.15 per cent) were medium long (120–129), the next largest group (34.88 per cent) being medium short (110–119). Ten Brahuis had long and 2 short faces.

The mean total facial index was 93.3, range 82–106. The majority (73.26 per cent) were leptoprosopic (89.5–X) with 20 Brahuis (23.26 per cent) mesoprosopic (84.6–89.4). Three men were euryprosopic (X–84.5).

Nasal Measurements and Indices (*see* table 93). The mean nasal height was 52.8, range 37–67. The majority (75.58 per cent) were medium (75.58) in length, the next largest group (18.60 per cent) being short (X–49). Five men had long noses. In breadth, the mean was 36.6, range 30–44. The majority (60–47 per cent) were medium wide (36–40), the next largest group (25.58 per cent) being medium narrow (30–35).

The mean nasal index was 68.7, range 52.93. The majority (51.15 per cent) were leptorrhine (X–67.4), the next largest group (44.19 per cent) being mesorrhine (67.5–83.4). Four Brahuis were platyrrhine (83.5–X).

Statistical Analyses (*see* table 94). The groupings for head breadth and minimum frontal diameter, for total facial height and bizygomatic diameter, for total and upper facial heights and for nasal height and breadth are given in tabular form.

Measurements and Indices (*see* table 95). The number of individuals, range, mean, standard deviation and coefficient of variation are given in a standard table for direct comparison with my other published anthropometric data recorded in Southwestern Asia.

SUMMARY

The average Brahui of Kalat is tall or medium in stature, possesses a wide forehead, a wide head, a dolicho-mesocephalic tending toward brachycephalic index, a medium long upper face, a medium long face, a leptoprosopic index, a nose medium short and medium wide with a leptorrhine to mesorrhine index.

COMPARISON BETWEEN 85 BALUCHIS AND 151 BRAHUIS

Tables 96–98 have been calculated for direct comparison between the Baluchis (Groups A, B, D) and the Brahuis (Groups C, E).

In order to present statistical differences between the Baluchis and the Brahuis, Professor William W. Howells, Harvard University, prepared table 99 and the following interpretation:

A summary view of the differences existing among these 5 groups of the Baluchistan population may be obtained by applying the analysis of variance and Snedecor's F test. The analysis of variance summarizes the variation within samples, and also the variation between samples. F is the ratio of the latter to the former: if it is significantly high—if the variation between groups is high relative to the general variation within groups—then it is implied that the groups are not random samples of a single population, but differ in their means for some real reason.

There are five local samples here altogether, of which 3 are Baluchis and 2 are Brahuis. We may look at the difference among them in four different ways. First, we might consider them all as mere samples of the Baluchistan population, and see whether they differ significantly among themselves, and in what measurements. Next we may treat the 3 samples of Baluchis to see whether they differ among themselves as Baluchis. Next we may do the same for the 2 Brahui samples. Finally, we may compare the total Baluchis and Brahuis to see whether they differ as major populations, regardless of any internal sample differences each may show.

Table 99 shows the size of the F ratio for each of the above comparisons, in each measurement. The levels of significance differ for each column, since such levels depend on the number of groups involved and the numbers in the groups.

Results. If all the samples are compared, in the first column, being viewed only as inhabitants of Baluchistan and without taking account of their being Baluchis or Brahuis, it can be asserted that these populations vary among themselves significantly, being differentiated in all measurements except minimum frontal diameter, and possibly excepting nasal breadth. These two measurements do not seem to discriminate Baluchistan samples.

The above effect can be seen, in the second column, to be to some extent a reflection of the fact that the Baluchi samples (A, B and D) differ significantly among themselves, in stature, head length, face heights and nose height. In the third column, however, the two Brahui groups, C and E, are seen to differ significantly only in the face heights, and are thus barely distinguished physically from one another (as far as these measurements go).

When the Baluchis and Brahuis are compared as total populations, in the last column, they are seen to differ in head length, head breadth and bigonial breadth to a definitely significant degree; possibly they differ in stature, bizygomatic diameter and the face heights as well. These differences exist even though the Baluchis differ among themselves in some of these measurements.

In general, the Baluchis are relatively heterogeneous from population to population, while the Brahuis, as far as can be told from these samples, are differentiated among themselves only in facial height. Baluchis and Brahuis are, at the same time, differentiated from one another.

For a description of the statistical methods employed, the reader is referred to Moroney (1956, pp. 371–76).

MISCELLANEOUS SERIES IN KALAT (F)

This series of 39 males was measured and observed in Kalat. They were members of the local Militia. Since they form a miscellaneous group, no valid deductions can be drawn. However, the raw data may prove of interest. Table 100 has been calculated; these figures should not be included in any comparative tables.

Tribal Groups. The groups or tribes represented were as follows: Afghan (Nos. 83 and 87); Araini (No. 97); Bazowi (No. 71); Bizanjau (No. 123); Hyderazi (No. 82); Khasgali (Nos. 116, 117, 122, 126, 127, 129, 130 and 137); Khawaja Khel (Nos. 69 and 76); Laze (Nos. 100, 112, 115 and 118–20); Nausherwani (No. 66); Pathan (Nos. 50, 58 and 95); Rais Zari (No. 80); Rikhi Zai (No. 81); Runja (Nos. 121, 125 and 133–36); Sasoli (No. 55); and unclassified (Nos. 98, 104, 106, 113 and 124).

Raw Data. The anthropometric forms have been placed on Microfilm No. 4786, pp. 1–139 and No. 4877, pp. 1–140 in the American Documentation Institute, c/o Photoduplication Service, Library of Congress, where a copy may be purchased.

BALUCHIS AND BRAHUIS AT MAND (G)

During our afternoon at Mand, Mrs. Field photographed 10 men: 6 Rind Baluchis (fig. 115) and 4 Brahuis (fig. 116). Since I was unable to measure this small series, I recorded the following observations on each individual.

BALUCHIS

No. 1. Unusually strong individual. Heavy body hair. Iranian Plateau type with large convex nose. Hair dark brown, almost black. Eyes dark brown with blue-ringed sclera. Stature 6 feet. Face large, long and wide. Brachycephalic. Ears small. Chest very well-developed. Stomach slightly protuberant.

No. 2. Eyes brown. Large convex nose. Stature 6 feet. Medium dark skin. Hair very dark brown or black. Shoulders narrow. Teeth good. Iranian Plateau type.

No. 3. Skin dark brown. Eyes brown. Nasal tip narrow. Nose convex of Iranian Plateau type. Hair dark brown. Stature about 5 feet 11 inches. Skin medium dark brown. Brachycephalic. Wore striped shirt. Profile photograph taken first. Hair brown with low waves. Lips thin, no eversion.

No. 4. Light yellowish skin, almost Mongoloid. Hair dark brown, low waves. Ears small. Nose thin and convex. Tall. Teeth excellent. Brachycephalic.

No. 5. Medium dark brown skin. Eyes dark brown. Hair dark brown with low waves. Teeth excellent. Feet small. Nose convex with thin nasal tip. Hair parted in center; grows very low on forehead. Brachycephalic. Ears small but tips slightly inverted.

No. 6. Eyes dark brown. Hair dark brown with low waves. Nose convex, with slightly flaring nostrils. Brachycephalic. Nasal tip very thin. Stature 6 feet. Skin dark brown.

BRAHUIS

No. 7. Skin yellowish-brown. Hair blond. Stature 5 feet 10 inches. Brachycephalic.

No. 8. Yellowish-brown skin. Nose convex. Forehead high. Stature 5 feet 6 inches.

No. 9. Makran plate on shoulder. Skin color yellowish-brown. Nose straight. Very round-headed. Spot tattooed on nasion. Hair parted in center. Mustache.

No. 10. Yellow shirt. Hair parted in center. Nose convex. Well-filied forehead. Brachycephalic. Mustache.

COMPARATIVE DATA

The groups of Baluchis and Brahuis, which were measured, observed and photographed during the Expedition, have been studied and analysed.

The next step will be to examine my metric results in relation to those obtained in Baluchistan by other physical anthropologists. In assembling these data (fig. 15) I have had the benefit of utilizing the measurements and indices compiled by Dr. Mario Cappieri in Rome. Furthermore, I have drawn on my published statistical tables (Field, 1956).

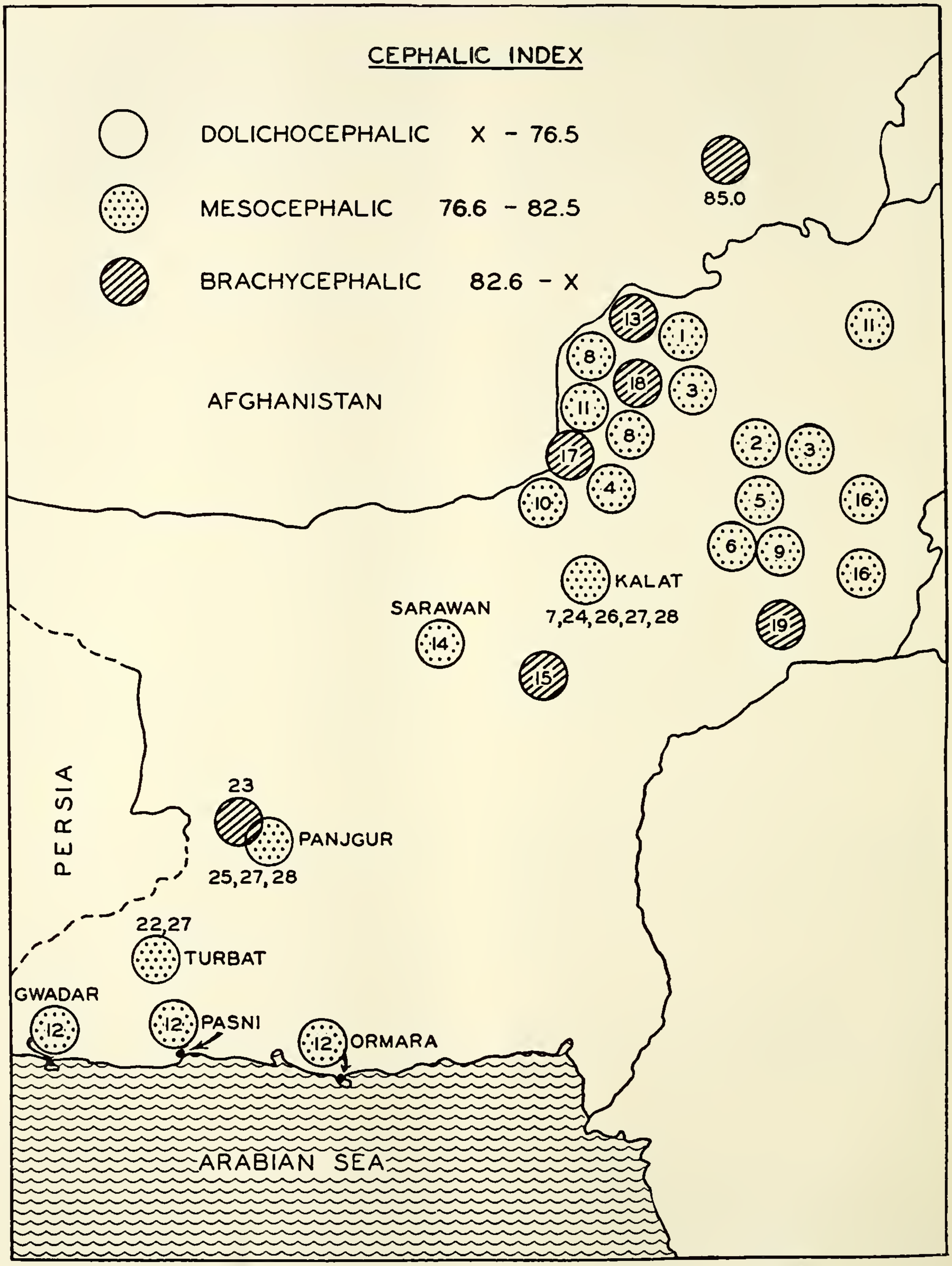

Fig. 15. Cephalic index of groups in Baluchistan.

TABLE 101. 29 GROUPS WITH 2,354 MALES MEASURED IN BALUCHISTAN

Group	*No.*	*Locality*	*Group*
1	58	Quetta, Laruna	Brahui, Mokaki
2	100	Harnai, Thal Chotiali	Makhiani (Pathan)
3	59	Babihan, Thal Chotiali	Wanechi (Pathan)
4	76	Mastung	Dehwari
5	100	Sibi	Jat (Jadgali)
6	100	Sibi	Pani (Pathan)
7	24	Kalat	Dehwari
8	100	Chaman, Quetta, Pishin	Achakzai (Pathan)
9	48	Sibi	Mir Jat (Jatki)
10	200	Mastung	Dehwari
11	112	Quetta, Zhob	Kakar (Pathan)
12	79	Pasni, Gwadar, Chabar, Ormara	Makrani (Med)
13	100	Pishin	Tarin (Pathan)
14	198	Sarawan	Brahui
15	77	Saruna	Brahui (Mengal)
16	271	Bugti Hills, Kachhi	Mari and Bugti (Baluchi)
17	33	Hinidan, Levy Tracts	Chhutta (Jadgali)
18	35	Kila, Levy Tracts	Bandijo (Jadgali)
19	13	———	Ghulam (Slaves)
20	35	———	Baluchi
21	25	Seistan	Seistani
22	34	Turbat	Baluchi
23	38	Panjgur	Baluchi
24	13	Kalat	Baluchi
25	65	Panjgur	Brahui
26	86	Kalat	Brahui
27	85	Turbat, Panjgur, Kalat	Baluchi
28	151	Panjgur, Kalat	Brahui
29	39	Baluchistan	Miscellanea

In table 101 Nos. 1–5, 7, 9, 12, 15, 17–18 were measured by Gupte; Nos. 20–21 were recorded by Sir Aurel Stein and analysed by Joyce; Nos. 22–29 were measured by Field in 1955. Attention must be called to the groupings of Nos. 22–24 in No. 27 and Nos. 25–27 in No. 28. The correct total is 2,118.

In order to present an assemblage of the most significant measurements and indices recorded on 29 groups with 2,354 males in Baluchistan, table 102 has been prepared from anthropometric data compiled by Cappieri from published sources. The figures for Nos. 20 and 21 could not be located. The key to the headings follows table 102.

Cappieri adds the following note regarding Nos. 24–28:

> The horizontal profile is a most important element for testing the so-called face-flatness, particularly remarkable with elements of the Mongoloid stock. A_1 represents the external orbital width, which is the straight measurement from *ek* to *ek*. A_2 represents the bi-orbito-nasal arc, from *ek* to *ek* passing on the nose root, *i.e.* a couple of *mm.* under *n.*
>
> The quotient $A_2/A_1 \times 100$ gives the average value of the index (No. 26). The scale of this index values is as follows:
>
> | *Group* | *Range* |
> |---|---|
> | Platyopic | X–107.5 |
> | Mesopic | 107.6–110.0 |
> | Prosopic | 110.1–X |
>
> For example, the value of A for No. 1=121.0, which falls into the high prosopic group. This shows that in these measurements No. 1 (the Lori of Quetta and Saruna) possess no relationship with the Mongoloids, confirming what is already obvious that the tribes and castes of Baluchistan have no hints of Mongoloid elements.

In order to present the statistical data for direct comparison with my previously pub-

TABLE 102. COMPARATIVE DATA

(*After* Cappieri)

No.	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
1	Brahui	58	177.6	192.0	158.0	139.5	152.0	130.0	78.5	90.0	71.0	56.4	66.0	44.0
2	Pathan	100	181.0	200.0	163.0	142.1	159.0	130.0	78.5	87.0	65.0	57.4	74.0	46.0
3	Pathan	59	178.1	195.0	161.0	141.2	155.0	126.0	79.2	89.0	70.0	56.9	66.0	48.0
4	Dehwar	76	179.4	200.0	165.0	142.2	155.0	130.0	79.2	88.0	68.0	54.9	68.0	45.0
5	Jat	100	177.8	196.0	160.0	141.9	155.0	130.0	79.8	92.0	70.0	56.1	64.0	44.0
6	Pathan	100	183.9	198.0	168.0	147.4	158.0	139.0	80.1	90.0	75.0	50.9	58.0	43.0
7	Dehwar	24	178.5	183.0	168.0	144.4	160.0	133.0	80.8	88.0	73.0	59.5	70.0	53.0
8	Pathan	100	187.7	210.0	175.0	152.4	171.0	140.0	81.1	91.0	74.0	55.3	63.0	48.0
9	Jat	48	180.1	200.0	162.0	146.4	158.0	135.0	81.2	96.0	73.0	57.3	86.0	48.0
10	Dehwar	200	179.4	198.0	165.0	146.6	159.0	131.0	81.7	91.0	72.0	48.4	59.0	42.0
11	Pathan	112	184.7	202.0	170.0	151.4	169.0	140.0	81.9	90.0	74.0	53.4	61.0	46.0
12	Med	79	181.4	200.0	170.0	148.9	160.0	136.0	82.0	92.0	77.0	55.9	68.0	44.0
13	Pathan	100	182.1	199.0	165.0	150.9	170.0	138.0	82.8	93.0	74.0	54.1	62.0	45.0
14	Brahui	198	182.0	197.0	166.0	148.4	165.0	135.0	81.5	92.0	72.0	57.3	65.0	41.0
15	Brahui	77	179.5	190.0	161.0	148.7	162.0	130.0	82.8	93.0	70.0	57.8	68.0	41.0
16	Baluchi	271	181.8	205.0	161.0	146.2	159.0	131.0	80.4	90.0	70.0	52.4	61.0	45.0
17	Jadgal	33	176.1	190.0	162.0	150.2	162.0	140.0	85.2	95.0	80.0	60.0	70.0	50.0
18	Jadgal	35	174.6	190.0	162.0	152.0	162.0	144.0	87.0	94.0	81.0	59.4	70.0	54.0
19	Ghulam	13	179.0	188.0	170.0	150.2	159.0	141.0	83.9	88.0	74.0	51.2	56.0	46.0
22	Baluchi	34	176.12	194.0	164.0	143.9	160.0	135.0	81.88	89.0	73.0	53.15	62.0	45.0
23	Baluchi	38	179.19	197.0	165.0	147.9	159.0	134.0	82.65	93.0	74.0	54.4	67.0	44.0
24	Baluchi	13	182.08	196.0	172.0	141.5	152.0	137.0	77.77	84.0	72.0	49.92	57.0	45.0
25	Brahui	65	181.1	190.0	168.0	143.1	156.0	132.0	79.08	87.0	72.0	51.1	60.0	42.0
26	Baluchi	86	183.3	196.0	168.0	141.0	162.0	124.0	77.09	88.0	69.0	52.8	66.0	43.0
27	Baluchi	85	178.4	197.0	164.0	145.3	160.0	134.0	81.58	93.0	72.0	53.2	67.0	44.0
28	Brahui	151	182.4	196.0	168.0	141.9	162.0	124.0	77.95	88.0	69.0	52.1	66.0	42.0
29	Miscellanea	39	179.8	195.0	167.0	141.2	155.0	128.0	78.7	88.0	69.0	52.4	67.0	43.0

Table 102. Comparative Data (*Continued*)

No.	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*
1	35.1	44.0	26.0	62.2	85.0	48.0				98.7	119.5	121.0	133.0	105.0
2	34.0	43.0	29.0	59.2	78.0	48.0				99.3	124.0	124.8	134.0	113.0
3	33.7	45.0	28.0	59.2	87.0	47.0				99.2	121.8	122.7	133.0	114.0
4	34.1	40.0	28.0	62.1	80.0	47.0				98.3	119.2	121.2	133.0	107.0
5	35.4	46.0	25.0	63.1	84.0	42.0				98.0	122.5	125.0	143.0	104.0
6	37.2	43.0	32.0	73.0	90.0	55.0	167.70	185.2	156.0	112.0	132.0	117.8	126.0	111.0
7	34.7	40.0	30.0	58.3	67.0	48.0				100.0	122.2	122.2	133.0	113.0
8	37.8	47.0	31.0	68.3	90.0	55.0	172.20	186.2	160.2	116.4	136.4	117.1	125.0	111.0
9	35.4	45.0	30.0	61.7	75.0	40.0				99.6	124.2	124.6	137.0	111.0
10	36.0	45.0	30.0	74.3	98.0	60.0	164.20	180.8	148.8	107.6	127.0	118.0	130.0	109.0
11	37.2	44.0	32.0	69.6	88.0	60.0	168.30	188.2	157.0	114.9	134.0	116.6	124.0	107.0
12	38.1	46.0	30.0	68.1	92.0	53.0				117.3	149.4	127.3	140.0	113.0
13	36.7	49.0	30.0	67.8	86.0	54.0	168.30	192.8	153.3	114.7	133.6	116.4	127.0	111.0
14	36.4	45.0	30.0	70.9	98.0	55.0	165.90	179.4	152.6	110.9	130.9	118.0	128.0	110.0
15	34.4	43.0	30.0	59.5	83.0	50.0				108.0	130.3	120.6	135.0	103.0
16	38.0	46.0	32.0	72.5	94.0	57.0	167.80	185.0	150.6	112.8	133.6	118.4	128.0	111.0
17	35.2	40.0	30.0	58.6	71.0	50.0				112.2	138.3	124.3	134.0	111.0
18	35.0	42.0	28.0	58.9	71.0	47.0				115.1	141.2	122.6	139.0	110.0
19	39.3	46.0	35.0	76.7	92.0	66.0	164.20	170.6	152.6	109.3	126.6	115.8	123.0	110.0
22	35.21	42.0	24.0	66.71	89.0	48.0	164.50	177.8	156.2					
23	37.0	44.0	33.0	68.4	84.0	57.0	171.56	182.9	162.6					
24	36.5	39.0	33.0	74.7	90.0	63.0	168.23	177.8	157.8					
25	35.8	42.0	25.0	70.4	89.0	57.0	170.65	181.6	158.8					
26	36.6	44.0	30.0	68.72	83.0	52.0	169.36	185.4	147.3					
27	36.2	44.0	24.0	68.70	90.0	48.0	168.23	182.9	156.2					
28	36.2	44.0	29.0	69.46	89.0	52.0	169.92	185.4	147.3					
29	37.6	46.0	32.0	72.2	88.0	58.0	168.59	185.4	154.9					

Key to Table 102

1	Group and locality
2	Number of individuals
3	Head length
4	Maximum head length
5	Minimum head length
6	Head breadth
7	Maximum head breadth
8	Minimum head breadth
9	Cephalic index
10	Maximum cephalic index
11	Minimum cephalic index
12	Nasal height
13	Maximum nasal height
14	Minimum nasal height
15	Nasal breadth
16	Maximum nasal breadth
17	Minimum nasal breadth
18	Nasal index
19	Maximum nasal index
20	Minimum nasal index
21	Stature
22	Maximum stature
23	Minimum stature
24-25	Horizontal profile dimensions, A_1 and A_2
26	Orbito-nasal index
27	Maximum orbito-nasal index
28	Minimum orbito-nasal index

lished 156 tables for Southwestern Asia (Field, 1957a), the following tables (103–110) and figure 16 have been compiled to show the cephalic index of the peoples of West Pakistan and India.

Table 103. Stature of 16 Groups with 1,605 Males

No.	*Group*	*Individuals*	*Stature*	*Recorder*
10	Dehwar	200	164.2	Risley
19	Ghulam	13	164.2	Risley
22	Baluchi	34	164.5	Field
14	Brahui	198	165.9	Risley
6	Pathan	100	167.7	Risley
16	Baluchi	271	167.8	Risley
24	Baluchi	13	168.2	Field
27	Baluchi	85	168.2	Field
11	Pathan	112	168.3	Risley
13	Pathan	100	168.3	Risley
29	Miscellanea	39	168.6	Field
26	Brahui	86	169.4	Field
28	Brahui	151	169.9	Field
25	Brahui	65	170.7	Field
23	Baluchi	38	171.6	Field
8	Pathan	100	172.2	Risley

Table 104. Head Length of 27 Groups with 2,294 Males

No.	*Group*	*Individuals*	*GOL*	*Recorder*
18	Jadgal	35	174.6	Gupte
17	Jadgal	33	176.1	Gupte
22	Baluchi	34	176.1	Field
1	Brahui	58	177.6	Gupte
5	Jat	100	177.8	Gupte
3	Pathan	59	178.1	Gupte
27	Baluchi	85	178.4	Field
7	Dehwar	24	178.5	Gupte
19	Ghulam	13	179.0	Risley
23	Baluchi	38	179.2	Field
4	Dehwar	76	179.4	Gupte
10	Dehwar	200	179.4	Risley
15	Brahui	77	179.5	Gupte
29	Miscellanea	39	179.8	Field
9	Jat	48	180.1	Gupte
2	Pathan	100	181.0	Gupte
25	Brahui	65	181.1	Field
12	Med	79	181.4	Gupte
16	Baluchi	271	181.8	Risley
14	Brahui	198	182.0	Risley
13	Pathan	100	182.1	Risley
24	Baluchi	13	182.1	Field
28	Brahui	151	182.4	Field
26	Brahui	86	183.3	Field
6	Pathan	100	183.9	Risley
11	Pathan	112	184.7	Risley
8	Pathan	100	188.7	Risley

Table 105. Head Breadth of 27 Groups with 2,294 Males

No.	*Group*	*Individuals*	*GB*	*Recorder*
1	Brahui	58	139.5	Gupte
26	Brahui	86	141.1	Field
3	Pathan	59	141.2	Gupte
29	Miscellanea	39	141.2	Field
24	Baluchi	13	141.5	Field
28	Brahui	151	141.9	Field
5	Jat	100	141.9	Gupte
2	Pathan	100	142.1	Gupte
4	Dehwar	76	142.2	Gupte
25	Brahui	65	143.1	Field
22	Baluchi	34	143.9	Field
7	Dehwar	24	144.4	Gupte
27	Baluchi	85	145.3	Field
16	Baluchi	271	146.2	Risley
9	Jat	48	146.4	Gupte
10	Dehwar	200	146.6	Risley
6	Pathan	100	147.4	Risley
23	Baluchi	38	147.9	Field
14	Brahui	198	148.4	Risley
15	Brahui	77	148.7	Gupte
12	Med	79	148.9	Gupte

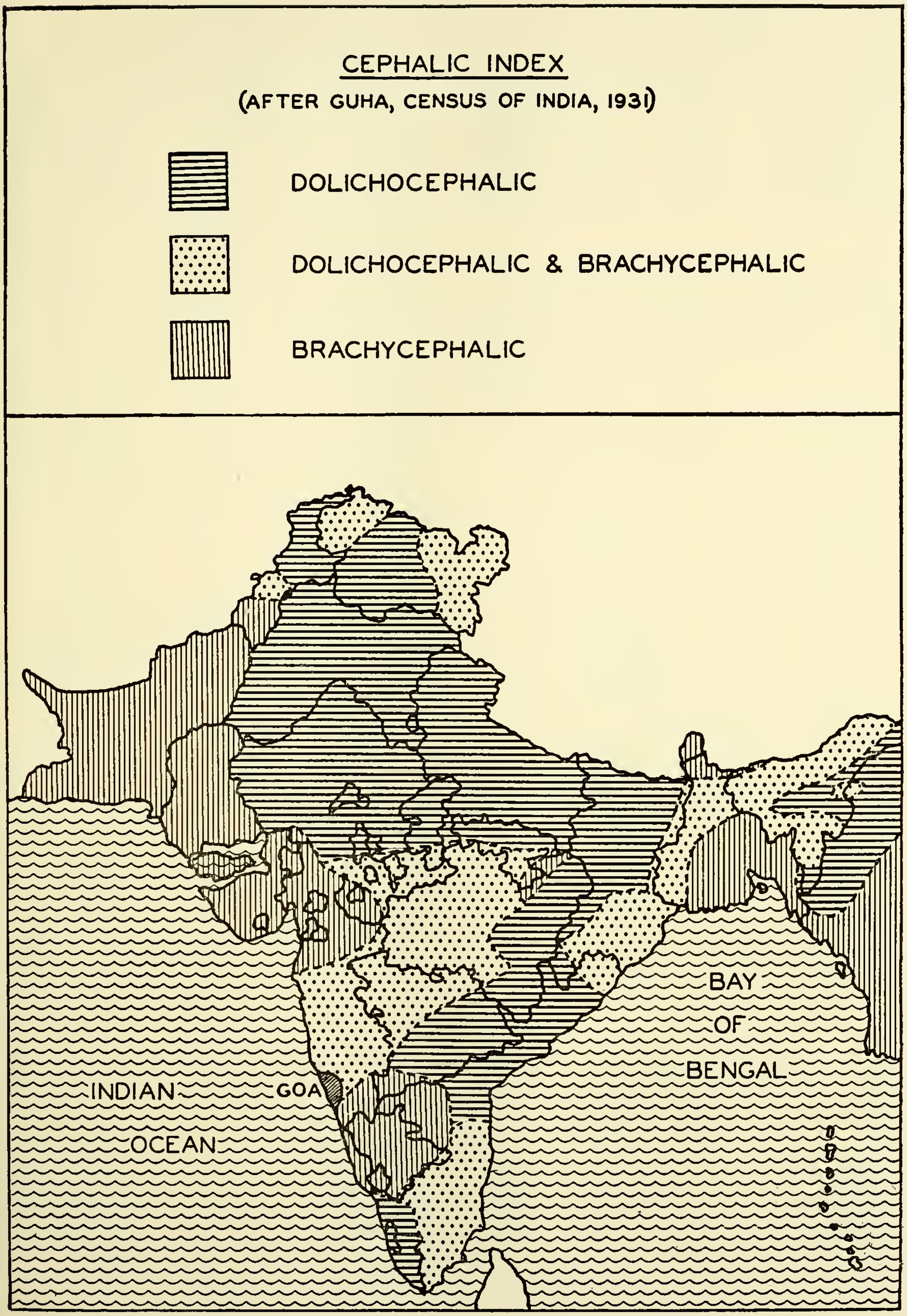

Fig. 16. Cephalic index of the peoples of West Pakistan and India (*after* Guha, Census of India, 1931).

TABLE 105. (*Continued*)

No.	*Group*	*Individuals*	*GB*	*Recorder*
17	Jadgal	33	150.2	Gupte
19	Ghulam	13	150.2	Risley
13	Pathan	100	150.9	Risley
11	Pathan	112	151.4	Risley
18	Jadgal	35	152.0	Gupte
8	Pathan	100	152.4	Risley

TABLE 106. CEPHALIC INDEX OF 29 GROUPS WITH 2,366 MALES

No.	*Group*	*No.*	*CI*	*Observer*
20	Baluchi	37	76.5	Stein and Joyce
21	Seistani	35	76.8	Stein and Joyce
26	Brahui	86	77.1	Field
24	Baluchi	13	77.8	Field
28	Brahui	151	77.9	Field
1	Brahui	58	78.5	Gupte
2	Pathan	100	78.5	Gupte
29	Miscellanea	39	78.7	Field
25	Brahui	65	79.1	Field
3	Pathan	59	79.2	Gupte
4	Dehwar	76	79.2	Gupte
5	Jat	100	79.8	Gupte
6	Pathan	100	80.1	Risley
16	Baluchi	271	80.4	Risley
7	Dehwar	24	80.8	Gupte
8	Pathan	100	81.1	Risley
9	Jat	48	81.2	Gupte
14	Brahui	198	81.5	Risley
27	Baluchi	85	81.6	Field
10	Dehwar	200	81.7	Risley
22	Baluchi	34	81.9	Field
11	Pathan	112	81.9	Risley
12	Med	79	82.1	Gupte
23	Baluchi	38	82.7	Field
13	Pathan	100	82.8	Risley
15	Brahui	77	82.8	Gupte
19	Ghulam	13	83.9	Risley
17	Jadgal	33	85.2	Gupte
18	Jadgal	35	87.9	Gupte

TABLE 107. MINIMUM FRONTAL DIAMETER OF 27 GROUPS WITH 2,294 MALES

No.	*Group*	*Individuals*	*MFD*	*Recorder*
1	Brahui	58	152.0	Gupte
24	Baluchi	13	152.0	Field
29	Miscellanea	39	155.0	Field
3	Pathan	59	155.0	Gupte
4	Dehwar	76	155.0	Gupte
5	Jat	100	155.0	Gupte
25	Brahui	65	156.0	Field
6	Pathan	100	158.0	Risley
9	Jat	48	158.0	Gupte
10	Dehwar	200	159.0	Risley
2	Pathan	100	159.0	Gupte
23	Baluchi	38	159.0	Field
16	Baluchi	271	159.0	Risley
19	Ghulam	13	159.0	Risley
7	Dehwar	24	160.0	Gupte
12	Med	79	160.0	Gupte
22	Baluchi	34	160.0	Field
27	Baluchi	85	160.0	Field
15	Brahui	77	162.0	Gupte
17	Jadgal	33	162.0	Gupte
18	Jadgal	35	162.0	Gupte
26	Brahui	86	162.0	Field
28	Brahui	151	162.0	Field
14	Brahui	198	165.0	Risley
11	Pathan	112	169.0	Risley
13	Pathan	100	170.0	Risley
8	Pathan	100	171.0	Risley

TABLE 108. NASAL HEIGHT OF 27 GROUPS WITH 2,294 MALES

No.	*Group*	*Individuals*	*NH*	*Recorder*
10	Dehwar	200	48.4	Risley
24	Baluchi	13	49.9	Field
6	Pathan	100	50.9	Risley
25	Brahui	65	51.1	Field
19	Ghulam	13	51.2	Risley
28	Brahui	151	52.1	Field
29	Miscellanea	39	52.4	Field
16	Baluchi	271	52.4	Risley
26	Brahui	86	52.8	Field
27	Baluchi	85	53.2	Field
22	Baluchi	34	53.2	Field
11	Pathan	112	53.4	Risley
23	Baluchi	38	54.0	Field
13	Pathan	100	54.1	Risley
4	Dehwar	76	54.9	Gupte
8	Pathan	100	55.3	Risley
12	Med	79	55.9	Gupte
5	Jat	100	56.1	Gupte
1	Brahui	58	56.4	Gupte
3	Pathan	59	56.9	Gupte
9	Jat	48	57.3	Gupte
14	Brahui	198	57.3	Risley
2	Pathan	100	57.4	Gupte
15	Brahui	77	57.8	Gupte
18	Jadgal	35	59.4	Gupte
7	Dehwar	24	59.5	Gupte
17	Jadgal	33	60.0	Gupte

TABLE 109. NASAL BREADTH OF 27 GROUPS WITH 2,294 MALES

No.	*Group*	*Individuals*	*NB*	*Recorder*
3	Pathan	59	33.7	Gupte
2	Pathan	100	34.0	Gupte
4	Dehwar	76	34.1	Gupte
15	Brahui	77	34.4	Gupte
7	Dehwar	24	34.7	Gupte
18	Jadgal	35	35.0	Gupte
1	Brahui	58	35.1	Gupte
17	Jadgal	33	35.2	Gupte
22	Baluchi	34	35.2	Field
5	Jat	100	35.4	Gupte
9	Jat	48	35.4	Gupte
25	Brahui	65	35.8	Field
10	Dehwar	200	36.0	Risley
27	Baluchi	85	36.2	Field
28	Brahui	151	36.2	Field
14	Brahui	198	36.4	Risley
24	Baluchi	13	36.5	Field
26	Brahui	86	36.6	Field
13	Pathan	100	36.7	Risley
23	Baluchi	38	37.0	Field
6	Pathan	100	37.2	Risley
11	Pathan	112	37.2	Risley
29	Miscellanea	39	37.6	Field
8	Pathan	100	37.8	Risley
16	Baluchi	271	38.0	Risley
12	Med	79	38.1	Gupte
19	Ghulam	13	39.3	Risley

TABLE 110. NASAL INDEX OF 27 GROUPS WITH 2,294 MALES

No.	*Group*	*Individuals*	*NI*	*Recorder*
7	Dehwar	24	58.3	Gupte
17	Jadgal	33	58.6	Gupte
18	Jadgal	35	58.9	Gupte
2	Pathan	100	59.2	Gupte
3	Pathan	59	59.2	Gupte
15	Brahui	77	59.5	Gupte
9	Jat	48	61.7	Gupte
4	Dehwar	76	62.1	Gupte
1	Brahui	58	62.2	Gupte
5	Jat	100	63.1	Gupte
22	Baluchi	34	66.7	Field
13	Pathan	100	67.8	Risley
12	Med	79	68.1	Gupte
8	Pathan	100	68.3	Risley
23	Baluchi	38	68.4	Field
26	Brahui	86	68.7	Field
27	Baluchi	85	68.7	Field
28	Brahui	151	69.5	Field
11	Pathan	112	69.6	Risley
25	Brahui	65	70.4	Field
14	Brahui	198	70.9	Risley
29	Miscellanea	39	72.2	Field
16	Baluchi	271	72.5	Risley
6	Pathan	100	73.0	Risley
10	Dehwar	200	74.3	Risley
24	Baluchi	13	74.7	Field
19	Ghulam	13	76.7	Risley

Miscellaneous selected data have been chosen from the Cappieri compilations for comparison with the preceding tables. These appear in table 111.

TABLE 111. COMPARATIVE DATA

No.	*Group or Locality*	*Stature*	*GOL*
1	Faizabad	166.9	181.92
2	Chitral	168.5	186.64
3	Pathan	168.7	185.2
4	Magar	164.8	190.7
5	Kafir	167.1	194.6
6	Hunza	170.8	192.8
7	Hazara	168.4	179.6
8	Tibetans	163.4	182.0
9	Kiranti	158.6	176.0
10	Kashmiri		
11	Singhalese	162.5	183.4
12	Mastuji	166.6	185.64
13	Bhotanese	167.2	183.0
14	Larikoli	163.8	183.23
15	Kokyar	162.9	179.19
16	Pakhpo	160.4	186.88
17	Bagh-Jigda	164.8	184.42
18	Wakhi	168.0	184.78
19	Kelpin	165.0	180.47
20	Dolan	164.1	182.20
21	Kirghiz	164.1	180.50
22	Aksu	163.8	173.92
23	Khombi	157.1	182.4
24	Khotan	165.5	182.50
25	Mangar	158.7	183.6
26	Limbu	160.3	181.4

TABLE 111. *(Continued)*

No.	*GB*	*CI*	*NH*	*NB*	*NI*
1	155.08	85.37	53.67	36.17	67.83
2	149.64	80.26	50.55	32.36	64.27
3	141.7	76.5	50.0	34.2	68.4
4	143.8	75.4	58.4	37.0	63.3
5	149.6	76.9	54.1	37.3	68.9
6	152.8	78.8	53.2	38.5	72.3
7	152.8	85.0	46.3	37.3	80.5
8	148.0	81.3	45.0	37.0	82.2

TABLE 111. (*Continued*)

No.	*GB*	*CI*	*NH*	*NB*	*NI*	*No.*	*GB*	*CI*	*NH*	*NB*	*NI*
9	145.0	82.3	42.0	36.0	85.7	18	156.68	84.81	50.42	35.94	71.32
10		71.9				19	156.33	86.73	48.60	38.67	79.67
11	143.9	78.4	47.7	39.2	82.6	20	156.47	85.39	51.19	39.94	78.19
12	149.39	80.56	46.79	33.61	72.59	21	160.84	88.18	49.26	38.21	78.13
13	147.0	80.3	48.0	37.0	77.0	22	155.00	89.20	52.85	36.54	70.23
14	149.45	81.88	47.60	34.02	71.95	23	147.8	81.0	50.0	38.3	76.6
15	153.22	85.44	50.59	36.73	73.00	24	153.47	84.21	49.91	36.89	74.70
16	148.56	79.88	48.68	35.68	73.80	25	145.2	79.9	49.6	38.0	76.6
17	146.67	79.62	45.42	34.92	77.25	26	153.1	84.3	50.2	37.2	74.1

ANTHROPOMETRIC DATA ON BALUCHISTAN

TABLE 12. LIST OF ANTHROPOMETRIC ABBREVIATIONS

B = head breadth
B′ = minimum frontal diameter
B′/B = fronto-parietal index
B′/J = zygo-frontal index
B/L = cephalic index
Big. B. = bigonial breadth
Biz. B. = bizygomatic breadth
C. F. = cephalic-facial index
C. I. = cephalic index
E. B. = ear breadth
EB/EL = ear index
E. I. = ear index
E. L. = ear length
F.G.I. = fronto-gonial index
F.P.I. = fronto-parietal index
G. B. = maximum head breadth
G. H. = total facial height
G′H = upper facial height
GH/J = facial index
G′H/J = upper facial index
Go-Go = bigonial breadth
Go-Go/J = zygo-gonial index
G.O.L. = glabella-occipital length
J = bizygomatic breadth
L = glabella-occipital length
L. L. = lower limb length
M.F.D. = minimum frontal diameter
N. B. = nasal breadth
N. H. = nasal height
NB/NH = nasal index
N. I. = nasal index
R.S.H. = relative sitting height
S. H. = sitting height
T.F.H. = total facial height
T.F.I. = total facial index
U.F.H. = upper facial height
U.F.I. = upper facial index
Zyg. fr. I. = zygo-frontal index
Zyg. go. I. = zygo-gonial index

34 BALUCHIS IN TURBAT (GROUP A)

TABLE 13. AGE DISTRIBUTION

Age	#	%
17–19	1	2.94
20–24	12	35.29
25–29	5	14.71
30–34	3	8.82
35–39	4	11.76
40–44	6	17.65
45–49	3	8.82
50–54	0	....
55–59	0	....
60–64	0	....
Total	34	99.99

TABLE 14. SKIN COLOR

	#	%
Forehead		
Brunet	20	60.61
Swarthy	12	36.36
Dark brown	1	3.03
Total	33	100.00
Inner Arm		
Brunet	18	54.55
Swarthy	14	42.42
Dark brown	1	3.03
Total	33	100.00

Table 15. Freckles

	#	%
Group		
Absent	28	90.32
Sub-medium	3	9.68
Total	31	100.00

Table 16. Moles

	#	%
Group		
Absent	19	57.58
Few	13	39.39
Many	1	3.03
Total	33	100.00

Table 17. Hair

	#	%
Color, Head		
Dark brown	33	100.00
Color, Beard or Mustache		
Dark brown	32	96.97
Brown	1	3.03
Total	33	100.00
Form		
Low waves	19	57.58
Deep waves	13	39.39
Frizzly	1	3.03
Total	33	100.00
Texture		
Medium	19	57.58
Fine	14	42.42
Total	33	100.00
Hair Quantity, Head		
Sub-medium	1	3.03
Medium	12	36.36
Pronounced	20	60.61
Total	33	100.00
Hair Quantity, Beard or Mustache		
Very small	4	14.81
Sub-medium	5	18.52
Medium	17	62.96
Pronounced	1	3.70
Total	27	99.99
Hair Quantity, Body		
Absent	9	30.00
Sub-medium	9	30.00
Medium	9	30.00
Pronounced	3	10.00
Total	30	100.00
Baldness		
Absent	28	84.85
Sub-medium	3	9.09
Medium	2	6.06
Total	33	100.00
Grayness, Head		
Absent	19	57.58
Sub-medium	11	33.33
Medium	3	9.09
Total	33	100.00
Grayness, Beard		
Absent	19	57.58
Sub-medium	11	33.33
Medium	3	9.09
Total	33	100.00

Table 18. Eyes

	#	%
Color		
Dark brown	23	69.69
Dark-light brown	7	21.21
Light brown	3	9.09
Total	33	99.99
Iris		
Clear	28	84.85
Rayed	4	12.12
Spotted	1	3.03
Total	33	100.00

Table 19. Eyebrows

	#	%
Concurrency		
Absent	4	19.05
Sub-medium	9	42.86
Medium	7	33.33
Pronounced	1	4.76
Total	21	100.00

Table 20. Browridges

	#	%
Development		
Absent	2	11.76
Sub-medium	7	41.18
Medium	8	47.06
Total	17	100.00

Table 21. Nose

	#	%
Profile		
Concave	2	6.06
Straight	5	15.15

TABLE 21. (*Continued*)

	#	%
Convex	24	72.72
Wavy	2	6.06
Total	33	99.99
Tip Thickness		
Sub-medium	11	33.33
Medium	17	51.52
Pronounced	4	12.12
Very pronounced	1	3.03
Total	33	100.00
Wings		
Compressed	10	31.25
Medium	19	59.37
Flaring	3	9.38
Total	32	100.00

TABLE 22. LIPS

	#	%
Eversion		
Sub-medium	4	18.18
Medium	10	45.45
Pronounced	8	36.36
Total	22	99.99

TABLE 23. TEETH

	#	%
Bite		
Edge-to-edge	2	9.52
Slight over	18	85.71
Pronounced over	1	4.76
Total	21	99.99
Loss		
None	2	8.33
Very small	19	79.17
Sub-medium	2	8.33
Medium	1	4.17
Total	24	100.00
Wear		
Medium	6	30.00
Pronounced	14	70.00
Total	20	100.00
Crowding		
Absent	12	92.31
Pronounced	1	7.69
Total	13	100.00
Eruption		
Complete	16	94.12
Partial	1	5.88
Total	17	100.00

TABLE 24. EARS

	#	%
Lobe		
Soldered	15	45.45
Attached	18	54.55
Total	33	100.00
Lobe, Size		
Sub-medium	17	54.84
Medium	13	41.94
Pronounced	1	3.23
Total	31	100.01
Protrusion		
Sub-medium	2	6.25
Medium	27	84.38
Pronounced	3	9.38
Total	32	100.01

TABLE 25. STATURE

	#	%
Harvard System		
Short (x–160.5)	8	23.53
Medium (160.6–169.4)	21	61.76
Tall (169.5–x)	5	14.71
Total	34	100.00
Keith System		
Short (x–159.9)	3	8.82
Medium (160.0–169.9)	26	76.47
Tall (170.0–179.9)	5	14.71
Very tall (180.0–x)	0	....
Total	34	100.00

TABLE 26. SITTING HEIGHT

	#	%
Group		
Very short (x–74.9)	0	....
Short (75.0–79.9)	1	2.94
Medium (80.0–84.9)	11	32.35
Long (85.0–89.9)	20	58.82
Very long (90.0–x)	2	5.88
Total	34	99.99

TABLE 27. HEAD MEASUREMENTS AND INDICES

	#	%
Head Breadth		
Very narrow (120–129)	0	....
Narrow (130–139)	11	32.35
Wide (140–149)	18	52.94
Very wide (150–x)	5	14.71
Total	34	100.00

Minimum Frontal Diameter	#	%
Very narrow (x–99)	0	....
Narrow (100–109)	10	29.41
Wide (110–119)	23	67.65
Very wide (120–x)	1	2.94
Total	34	100.00

Cephalic Index

Harvard System	#	%
Dolichocephalic (x–76.5)	4	11.76
Mesocephalic (76.6–82.5)	18	52.94
Brachycephalic (82.6–x)	12	35.29
Total	34	99.99

Keith System	#	%
Ultradolichocephalic (x–70.0)	0	....
Dolichocephalic (70.1–75.0)	2	5.88
Mesocephalic (75.1–79.9)	8	23.53
Brachycephalic (80.0–84.9)	14	41.18
Ultrabrachycephalic (85.0–x)	10	29.41
Total	34	100.00

Table 28. Facial Measurements and Indices

Upper Facial Height	#	%
Short (x–63)	0	....
Medium short (64–69)	8	23.53
Medium long (70–75)	15	44.12
Long (76–x)	11	32.35
Total	34	100.00

Total Facial Height	#	%
Short (x–109)	1	2.94
Medium short (110–119)	19	55.88
Medium long (120–129)	14	41.18
Long (130–x)	0	....
Total	34	100.00

Total Facial Index	#	%
Euryprosopic (x–84.5)	2	5.88
Mesoprosopic (84.6–89.4)	11	32.35
Leptoprosopic (89.5–x)	21	61.76
Total	34	99.99

Table 29. Nasal Measurements and Indices

Nasal Height	#	%
Short (x–49)	5	14.71
Medium (50–59)	25	73.53
Long (60–x)	4	11.76
Total	34	100.00

Nasal Breadth	#	%
Very narrow (x–29)	1	2.94
Medium narrow (30–35)	13	38.24
Medium wide (36–41)	19	55.88
Wide (42–x)	1	2.94
Total	34	100.00

Nasal Index	#	%
Leptorrhine (x–67.4)	22	64.71
Mesorrhine (67.5–83.4)	11	32.35
Platyrrhine (83.5–x)	1	2.94
Total	34	100.00

Table 30. Statistical Analyses of 34 Baluchis in Turbat (Group A)

Minimum Frontal Diameter

	x–99		*100–109*		*110–119*		*120–x*		*Total*	
Head Breadth	#	%	#	%	#	%	#	%	#	%
120–129	0	....	0	....	0	....	0	....	0	....
130–139	0	....	5	14.71	5	14.71	1	2.94	11	32.36
140–149	0	....	4	11.76	14	41.18	0	....	18	52.94
150–x	0	....	1	2.94	4	11.76	0	....	5	14.70
Total			10	29.41	23	67.65	1	2.94	34	100.00

Bizygomatic Diameter

	x–124		*125–134*		*135–x*		*Total*	
Total Facial Height	#	%	#	%	#	%	#	%
x–114	1	2.94	5	14.71	1	2.94	7	20.59
115–124	4	11.76	10	29.41	5	14.71	19	55.88
125–x	0	....	3	8.82	5	14.71	8	23.53
Total	5	14.70	18	52.94	11	32.36	34	100.00

TABLE 30. (*Continued*)

Upper Facial Height

Total Facial Height	*x–63* #	%	*64–69* #	%	*70–75* #	%	*76–81* #	%	*82–x* #	%	*Total* #	%
x–109	0	....	1	2.94	0	....	0	....	0	....	1	2.94
110–119	0	....	5	14.71	10	29.41	4	11.76	0	....	19	55.88
120–129	0	....	2	5.88	5	14.71	7	20.59	0	....	14	41.18
130–x	0	....	0	....	0	....	0	....	0	....	0	....
Total			8	23.53	15	44.12	11	32.35	0	0	34	100.00

Nasal Breadth

Nasal Height	*x–29* #	%	*30–35* #	%	*36–41* #	%	*42–x* #	%	*Total* #	%
x–49	0	....	2	5.88	2	5.88	1	2.94	5	14.70
50–59	1	2.94	10	29.41	14	41.18	0	....	25	73.53
60–x	0	....	1	2.94	3	8.82	0	....	4	11.76
Total	1	2.94	13	38.23	19	55.88	1	2.94	34	99.99

TABLE 31. MEASUREMENTS AND INDICES OF 34 BALUCHIS IN TURBAT (GROUP A)

Measurements	*No.*	*Range*	*Mean*	*S.D.*	*C.V.*
Age	34	18–45	30.12 ± 0.98	8.50 ± 0.70	2.82 ± 0.23
Stature	34	1562–1778	1645.02 ± 0.59	5.11 ± 0.42	3.11 ± 0.25
Sitting height	34	762–914	838.12 ± 4.17	36.09 ± 2.95	4.31 ± 0.35
Head length	34	164–194	176.12 ± 0.76	6.56 ± 0.54	3.73 ± 0.31
Head breadth	34	135–160	143.94 ± 0.71	6.15 ± 0.50	4.27 ± 0.35
Minimum frontal diameter	34	102–127	111.62 ± 0.53	4.62 ± 0.38	4.14 ± 0.34
Bizygomatic breadth	34	113–142	130.26 ± 0.70	6.09 ± 0.50	4.67 ± 0.38
Bigonial breadth	33	96–118	105.55 ± 0.58	4.91 ± 0.41	4.65 ± 0.39
Total facial height	34	108–129	119.29 ± 0.63	5.41 ± 0.44	4.53 ± 0.37
Upper facial height	34	65–79	72.85 ± 0.49	4.21 ± 0.34	5.78 ± 0.47
Nasal height	34	45–62	53.15 ± 0.49	4.26 ± 0.35	8.02 ± 0.66
Nasal breadth	34	24–42	35.21 ± 0.35	3.06 ± 0.25	8.69 ± 0.71
Ear length	33	48–72	58.73 ± 0.67	5.67 ± 0.67	9.65 ± 0.80
Ear breadth	33	32–41	36.24 ± 0.25	2.09 ± 0.17	5.77 ± 0.48
Indices					
Cephalic	34	73–89	81.88 ± 0.53	4.59 ± 0.38	5.61 ± 0.46
Fronto-parietal	34	71–92	77.79 ± 0.51	4.41 ± 0.36	5.67 ± 0.46
Cephalic-facial	34	82–102	90.74 ± 0.50	4.29 ± 0.35	4.73 ± 0.39
Zygo-frontal	34	80–109	85.97 ± 0.65	5.59 ± 0.46	6.50 ± 0.53
Fronto-gonial	33	81–103	94.48 ± 0.62	5.30 ± 0.44	5.61 ± 0.47
Zygo-gonial	33	72–96	81.06 ± 0.55	4.70 ± 0.39	5.80 ± 0.48
Total facial	34	84–109	91.71 ± 0.63	5.41 ± 0.44	5.90 ± 0.48
Upper facial	34	50–69	56.03 ± 0.40	3.47 ± 0.28	6.19 ± 0.51
Nasal	34	48–89	66.71 ± 0.94	8.15 ± 0.67	12.22 ± 1.00
Ear	33	50–79	62.33 ± 0.75	6.42 ± 0.53	10.30 ± 0.86

38 BALUCHIS IN PANJGUR (GROUP B)

TABLE 32. AGE DISTRIBUTION

Age	#	%
17–19	2	5.26
20–24	14	36.84
25–29	10	26.32
30–34	5	13.16
35–39	6	15.79
40–44	1	2.63
45–49	0	....
50–54	0	....
55–59	0	....
60–64	0	....
Total	38	100.00

TABLE 33. SKIN COLOR

	#	%
Forehead		
Pink	1	2.94
Brunet	22	64.71
Swarthy	11	32.35
Total	34	100.00
Inner Arm		
Pink	1	2.94
Brunet	22	64.71
Swarthy	11	32.35
Total	34	100.00

TABLE 34. FRECKLES

Group	#	%
Absent	22	64.71
Sub-medium	10	29.41
Medium	2	5.88
Total	34	100.00

TABLE 35. MOLES

Group	#	%
Absent	16	47.06
Few	17	50.00
Many	1	2.94
Total	34	100.00

TABLE 36. HAIR

	#	%
Color, Head		
Dark brown	38	100.00
Color, Beard or Mustache		
Dark brown	38	100.00
Form		
Low waves	23	60.53
Deep waves	14	36.84
Curly	1	2.63
Total	38	100.00
Texture		
Coarse	6	15.79
Medium	25	65.79
Fine	7	18.42
Total	38	100.00
Hair Quantity, Head		
Sub-medium	1	3.85
Medium	18	69.23
Pronounced	7	26.92
Total	26	100.00
Baldness		
Absent	34	97.14
Sub-medium	1	2.86
Total	35	100.00
Grayness, Head		
Absent	36	94.74
Sub-medium	2	5.26
Total	38	100.00
Grayness, Beard or Mustache		
Absent	23	95.83
Medium	1	4.17
Total	24	100.00

TABLE 37. EYES

	#	%
Color		
Dark brown	34	89.47
Light brown	2	5.26
Green-brown	2	5.26
Total	38	99.99
Iris		
Clear	31	86.11
Rayed	2	5.56
Spotted	3	8.33
Total	36	100.00

TABLE 38. NOSE

Profile	#	%
Concave	3	7.89
Straight	7	18.42

TABLE 38. (*Continued*)

	#	%
Convex	26	68.42
Wavy	2	5.26
Total	38	99.99
Tip Thickness		
Sub-medium	11	28.95
Medium	24	63.16
Pronounced	3	7.89
Total	38	100.00
Wings		
Compressed	13	34.21
Medium	25	65.79
Flaring	0	....
Total	38	100.00

TABLE 39. TEETH

	#	%
Bite		
Edge-to-edge	2	7.41
Sub-medium over	22	81.48
Pronounced over	3	11.11
Total	27	100.00
Loss		
None	12	42.86
Very small	14	50.00
Sub-medium	2	7.14
Total	28	100.00
Wear		
Sub-medium	2	6.45
Medium	19	61.29
Pronounced	10	32.26
Total	31	100.00
Crowding		
Absent	22	95.65
Medium	0	....
Pronounced	1	4.35
Total	23	100.00
Eruption		
Complete	9	52.94
Partial	8	47.06
Total	17	100.00

TABLE 40. LIPS

	#	%
Eversion		
Medium	6	42.86
Pronounced	7	50.00
Very pronounced	1	7.14
Total	14	100.00

TABLE 41. EARS

	#	%
Lobe		
Soldered	2	5.26
Attached	36	94.74
Free	0	....
Total	38	100.00
Lobe, Size		
Absent	1	2.63
Sub-medium	28	73.68
Medium	9	23.68
Total	38	99.99
Protrusion		
Sub-medium	7	18.92
Medium	27	72.97
Pronounced	3	8.11
Total	37	100.00

TABLE 42. STATURE

	#	%
Harvard System		
Short (x–160.5)	2	5.41
Medium (160.6–169.4)	17	45.95
Tall (169.5–x)	18	48.65
Total	37	100.01
Keith System		
Short (x–159.9)	0	....
Medium (160.0–169.9)	13	34.21
Tall (170.0–179.9)	22	57.89
Very tall (180.0–x)	3	7.89
Total	38	99.99

TABLE 43. SITTING HEIGHT

	#	%
Group		
Very short (x–74.9)	0	....
Short (75.0–79.9)	0	....
Medium (80.0–84.9)	6	15.79
Long (85.0–89.9)	26	68.42
Very long (90.0–x)	6	15.79
Total	38	100.00

TABLE 44. HEAD MEASUREMENTS AND INDICES

	#	%
Head Breadth		
Very narrow (120–129)	0	....
Narrow (130–139)	12	32.43
Wide (140–149)	10	27.03
Very wide (150–x)	15	40.54
Total	37	100.00

Minimum Frontal Diameter	#	%
Very narrow (x–99)	0	....
Narrow (100–109)	12	32.43
Wide (110–119)	23	62.16
Very wide (120–x)	2	5.41
Total	37	100.00

Cephalic Index

Harvard System		
Dolichocephalic (x–76.5)	2	5.41
Mesocephalic (76.6–82.5)	17	45.95
Brachycephalic (82.6–x)	18	48.65
Total	37	100.01

Keith System		
Ultradolichocephalic (x–70.0)	1	2.70
Dolichocephalic (70.1–75.0)	6	16.22
Mesocephalic (75.1–79.9)	19	51.35
Brachycephalic (80.0–84.9)	11	29.75
Ultrabrachycephalic (85.0–x)	0	....
Total	37	100.02

Table 45. Facial Measurements and Indices

Upper Facial Height	#	%
Short (x–63)	1	2.70
Medium short (64–69)	9	24.32
Medium long (70–75)	9	24.32
Long (76–x)	18	48.65
Total	37	99.99

Total Facial Height	#	%
Short (x–109)	1	2.70
Medium short (110–119)	7	18.92
Medium long (120–129)	21	56.76
Long (130–x)	8	21.62
Total	37	100.00

Total Facial Index		
Euryprosopic (x–84.5)	3	8.11
Mesoprosopic (84.6–89.4)	4	10.81
Leptoprosopic (89.5–x)	30	81.08
Total	37	100.00

Table 46. Nasal Measurements and Indices

Nasal Height	#	%
Short (x–49)	4	10.81
Medium (50–59)	30	81.08
Long (60–x)	3	8.11
Total	37	100.00

Nasal Breadth		
Very narrow (x–29)	0	....
Medium narrow (30–35)	7	18.92
Medium wide (36–41)	29	78.38
Wide (42–x)	1	2.70
Total	37	100.00

Nasal Index		
Leptorrhine (x–67.4)	23	62.16
Mesorrhine (67.5–83.4)	14	37.84
Platyrrhine (83.5–x)	0	....
Total	37	100.00

Table 47. Statistical Analyses of 38 Baluchis in Panjgur (Group B)

Minimum Frontal Diameter

	x–99		*100–109*		*110–119*		*120–x*		*Total*	
Head Breadth	#	%	#	%	#	%	#	%	#	%
120–129	0	....	0	....	0	....	0	....	0	....
130–139	0	....	2	5.41	0	..	0	....	2	5.41
140–149	0	....	6	16.22	13	35.14	1	2.70	20	54.06
150–x	0	....	4	10.81	10	27.03	1	2.70	15	40.54
Total	0	0	12	32.44	23	62.17	2	5.40	37	100.01

Bizygomatic Diameter

	x–124		*125–134*		*135–x*		*Total*	
Total Facial Height	#	%	#	%	#	%	#	%
x–114	0	....	1	2.70	1	2.70	2	5.40
115–124	2	5.41	9	24.32	5	13.51	16	43.24
125–x	1	2.70	8	21.62	10	27.03	19	51.35
Total	3	8.11	18	48.64	16	43.24	37	99.99

TABLE 47. (*Continued*)

Upper Facial Height

	x–63		*64–69*		*70–75*		*76–81*		*82–x*		*Total*	
Total Facial Height	#	%	#	%	#	%	#	%	#	%	#	%
x–109	1	2.70	0	....	0	....	0	....	0	....	1	2.70
110–119	0	....	6	16.22	1	2.70	0	....	0	....	7	18.92
120–129	0	....	3	8.11	13	35.14	4	10.81	1	2.70	21	56.76
130–x	0	....	0	....	2	5.41	3	8.11	3	8.11	8	21.63
Total ..	1	2.70	9	24.33	16	43.25	7	18.92	4	10.81	37	100.01

Nasal Breadth

	x–29		*30–35*		*36–41*		*42–x*		*Total*	
Nasal Height	#	%	#	%	#	%	#	%	#	%
x–49	0	....	1	2.70	3	8.11	0	....	4	10.81
50–59	0	....	6	16.22	23	62.16	1	2.70	30	81.08
60–x	0	....	0	....	3	8.11	0	....	3	8.11
Total	0	0	7	18.92	29	78.38	1	2.70	37	100.00

TABLE 48. MEASUREMENTS AND INDICES OF 38 BALUCHIS IN PANJGUR (GROUP B)

Measurements	*No.*	*Range*	*Mean*	*S.D.*	*C.V.*
Age	38	19–40	26.39 ± 0.62	5.71 ± 0.44	2.16 ± 0.17
Stature	38	1626–1829	1715.61 ± 0.55	5.00 ± 0.39	2.91 ± 0.23
Sitting height	38	813–991	865.21 ± 4.30	39.29 ± 3.04	4.54 ± 0.35
Head length	37	165–197	179.19 ± 0.70	6.35 ± 0.50	3.54 ± 0.28
Head breadth	37	134–159	147.89 ± 0.62	5.57 ± 0.44	3.77 ± 0.30
Minimum frontal diameter	37	103–123	112.32 ± 0.53	4.76 ± 0.37	4.24 ± 0.33
Bizygomatic breadth .	37	122–142	132.49 ± 0.55	4.97 ± 0.39	3.75 ± 0.29
Bigonial breadth	36	97–124	107.64 ± 0.64	5.69 ± 0.45	5.29 ± 0.42
Total facial height ...	37	107–142	124.76 ± 0.76	6.81 ± 0.53	5.46 ± 0.43
Upper facial height ..	37	62–85	73.81 ± 0.57	5.16 ± 0.40	6.99 ± 0.55
Nasal height	37	44–67	54.41 ± 0.48	4.35 ± 0.34	7.99 ± 0.63
Nasal breadth	37	33–44	37.00 ± 0.26	2.32 ± 0.18	6.27 ± 0.49
Ear length	36	45–74	59.83 ± 0.66	5.83 ± 0.46	9.74 ± 0.77
Ear breadth	36	30–42	36.22 ± 0.31	2.75 ± 0.22	7.49 ± 0.60
Indices					
Relative sitting height	38	47–58	50.53 ± 0.25	2.26 ± 0.17	4.47 ± 0.35
Cephalic	37	74–93	82.65 ± 0.43	3.84 ± 0.30	4.65 ± 0.36
Fronto-parietal	37	68–83	76.05 ± 0.40	3.57 ± 0.28	4.69 ± 0.37
Cephalic-facial	37	84–96	89.57 ± 0.37	3.35 ± 0.26	3.74 ± 0.29
Zygo-frontal	37	78–91	84.84 ± 0.32	2.92 ± 0.23	3.44 ± 0.27
Fronto-gonial	37	91–113	96.35 ± 0.50	4.54 ± 0.36	4.71 ± 0.37
Zygo-gonial	36	74–90	81.25 ± 0.41	3.61 ± 0.29	4.44 ± 0.35
Total facial	37	83–104	94.19 ± 0.57	5.16 ± 0.40	5.48 ± 0.43
Upper facial	37	48–63	55.81 ± 0.42	3.78 ± 0.30	6.77 ± 0.53
Nasal	37	57–84	68.43 ± 0.72	6.51 ± 0.51	9.51 ± 0.75
Ear	36	49–71	60.97 ± 0.63	5.58 ± 0.44	9.15 ± 0.73

65 BRAHUIS IN PANJGUR (GROUP C)

Table 49. Age Distribution

	#	%
Age		
17–19	32	49.23
20–24	16	24.62
25–29	8	12.31
30–34	8	12.31
35–39	1	1.54
40–x	0	....
Total	65	100.01

Table 50. Skin Color

	#	%
Forehead		
Brunet	41	63.08
Swarthy	24	36.92
Total	65	100.00
Inner Arm		
Brunet	13	52.00
Swarthy	12	48.00
Total	25	100.00

Table 51. Freckles

	#	%
Group		
Absent	31	49.21
Sub-medium	30	47.62
Medium	2	3.17
Total	63	100.00

Table 52. Moles

	#	%
Group		
Absent	19	29.23
Few	41	63.08
Many	5	7.70
Total	65	100.01

Table 53. Hair

	#	%
Color, Head		
Dark brown	65	100.00
Color, Beard or Mustache		
Dark brown	62	100.00
Form		
Low waves	58	90.63
Deep waves	6	9.38
Total	64	100.01
Texture		
Coarse	3	4.62
Medium	54	83.08
Fine	8	12.31
Total	65	100.01
Hair Quantity, Head		
Medium	19	86.36
Pronounced	3	13.64
Total	22	100.00
Baldness		
Absent	64	98.46
Sub-medium	1	1.54
Total	65	100.00
Grayness, Head		
Absent	60	92.31
Sub-medium	5	7.70
Total	65	100.01

Table 54. Eyes

	#	%
Color		
Dark brown	60	92.31
Light brown	4	6.15
Green-brown	1	1.54
Total	65	100.00
Iris		
Clear	61	93.85
Spotted	4	6.15
Total	65	100.00

Table 55. Nose

	#	%
Profile		
Concave	17	26.56
Straight	14	21.88
Convex	32	50.00
Wavy	1	1.56
Total	64	100.00
Tip Thickness		
Sub-medium	45	69.23
Medium	19	29.23
Pronounced	1	1.54
Very pronounced	0	....
Total	65	100.00
Wings		
Compressed	32	49.23

TABLE 55. (*Continued*)

	#	%
Medium	33	50.76
Flaring	0	....
Total	65	99.99

TABLE 56. LIPS

	#	%
Eversion		
Sub-medium	4	14.29
Medium	11	39.29
Pronounced	11	39.29
Very pronounced	2	7.14
Total	28	100.01

TABLE 57. TEETH

	#	%
Bite		
Edge-to-edge	2	3.33
Sub-medium over	50	83.33
Pronounced over	8	13.33
Total	60	99.99
Loss		
None	54	91.53
Very small	4	6.78
Sub-medium	1	1.69
Total	59	100.00
Wear		
Absent	24	40.00
Medium	29	48.33
Pronounced	7	11.67
Total	60	100.00
Crowding		
Absent	50	86.21
Medium	6	10.34
Pronounced	2	3.45
Total	58	100.00
Eruption		
Complete	29	56.86
Partial	22	43.14
Total	51	100.00

TABLE 58. EARS

	#	%
Lobe		
Attached	65	100.00
Lobe, Size		
Sub-medium	30	78.95
Medium	6	15.79
Pronounced	2	5.26
Total	38	100.00
Protrusion		
Sub-medium	16	24.62
Medium	46	70.77
Pronounced	3	4.62
Total	65	100.01

TABLE 59. STATURE

	#	%
Harvard System		
Short (x–160.5)	3	4.62
Medium (160.6–169.4)	26	40.00
Tall (169.5–x)	36	55.38
Total	65	100.00
Keith System		
Short (x–159.9)	1	1.54
Medium (160.0–169.9)	28	43.08
Tall (170.0–179.9)	34	52.31
Very tall (180.0–x)	2	3.08
Total	65	100.00

TABLE 60. SITTING HEIGHT

	#	%
Group		
Very short (x–74.9)	0	....
Short (75.0–79.9)	2	3.08
Medium (80.0–84.9)	15	23.08
Long (85.0–89.9)	45	69.23
Very long (90.0–x)	3	4.62
Total	65	100.01

TABLE 61. HEAD MEASUREMENTS AND INDICES

	#	%
Head Breadth		
Very narrow (120–129)	1	1.54
Narrow (130–139)	22	33.85
Wide (140–149)	35	53.85
Very wide (150–x)	7	10.77
Total	65	100.01
Minimum Frontal Diameter		
Very narrow (x–99)	0	....
Narrow (100–109)	14	21.54
Wide (110–119)	50	76.92
Very wide (120–x)	1	1.54
Total	65	100.00

Cephalic Index

	#	%
Harvard System		
Dolichocephalic (x–76.5)	18	27.69
Mesocephalic (76.6–82.5)	32	49.23
Brachycephalic (82.6–x)	15	23.08
Total	65	100.00

Keith System	#	%
Ultradolichocephalic (x–70.0)	0	....
Dolichocephalic (70.1–75.0)	15	23.08
Mesocephalic (75.1–79.9)	17	26.15
Brachycephalic (80.0–84.9)	28	43.08
Ultrabrachycephalic (85.0–x)	5	7.69
Total	65	100.00

Table 62. Facial Measurements and Indices

	#	%
Upper Facial Height		
Short (x–63)	10	15.38
Medium short (64–69)	23	35.38
Medium long (70–75)	19	29.23
Long (76–x)	13	20.00
Total	65	99.99
Total Facial Height		
Short (x–109)	3	4.62
Medium short (110–119)	29	44.62
Medium long (120–129)	31	47.69
Long (130–x)	2	3.08
Total	65	100.01
Total Facial Index		
Euryprosopic (x–84.0)	6	9.23
Mesoprosopic (84.6–89.4)	26	40.00
Leptoprosopic (89.5–x)	33	50.77
Total	65	100.00

Table 63. Nasal Measurements and Indices

	#	%
Nasal Height		
Short (x–49)	21	32.31
Medium (50–59)	43	66.15
Long (60–x)	1	1.54
Total	65	100.00
Nasal Breadth		
Very narrow (x–29)	1	1.54
Medium narrow (30–35)	18	27.69
Medium wide (36–41)	44	67.69
Wide (42–x)	2	3.08
Total	65	100.00
Nasal Index		
Leptorrhine (x–67.4)	29	44.62
Mesorrhine (67.5–83.4)	34	52.31
Platyrrhine (83.5–x)	2	3.08
Total	65	100.01

Table 64. Statistical Analyses of 65 Brahuis in Panjgur (Group C)

Minimum Frontal Diameter

	x–99		*100–109*		*110–119*		*120–x*		*Total*	
Head Breadth	#	%	#	%	#	%	#	%	#	%
120–129	0	....	0	....	0	....	0	....	0	....
130–139	0	....	9	13.85	14	21.54	0	....	23	35.39
140–149	0	....	6	9.23	29	44.62	0	....	35	53.85
150–x	0	....	0	....	6	9.23	1	1.54	7	10.77
Total	0	0	15	23.08	49	75.39	1	1.54	65	100.01

Bizygomatic Diameter

	x–124		*125–134*		*135–x*		*Total*	
Total Facial Height	#	%	#	%	#	%	#	%
x–114	1	1.54	7	10.77	2	3.08	10	15.39
115–124	0	....	24	36.92	13	20.00	37	56.92
125–x	0	....	8	12.31	10	15.38	18	27.69
Total	1	1.54	39	60.00	25	42.46	65	100.00

TABLE 64. (*Continued*)

Upper Facial Height

	x–63		*64–69*		*70–75*		*76–81*		*82–x*		*Total*	
Total Facial Height	#	%	#	%	#	%	#	%	#	%	#	%
x–109	2	3.08	1	1.54	0	....	0	....	0	....	3	4.62
110–119	5	7.69	14	21.54	9	13.85	0	....	0	....	28	43.08
120–129	0	....	11	16.92	14	21.54	7	10.77	0	....	32	49.23
130–x	0	....	0	....	1	1.54	1	1.54	0	....	2	3.08
Total	7	10.77	26	40.00	24	36.93	8	12.31	0	0	65	100.01

Nasal Breadth

	x–29		*30–35*		*36–41*		*42–x*		*Total*	
Nasal Height	#	%	#	%	#	%	#	%	#	%
x–49	0	....	9	13.85	12	18.46	0	....	21	32.31
50–59	1	1.54	18	27.69	23	35.38	1	1.54	43	66.15
60–x	0	....	0	....	1	1.54	0	....	1	1.54
Total	1	1.54	27	41.54	36	55.38	1	1.54	65	100.00

TABLE 65. MEASUREMENTS AND INDICES OF 65 BRAHUIS IN PANJGUR (GROUP C)

Measurements	*No.*	*Range*	*Mean*	*S.D.*	*C.V.*
Age	65	18–36	21.49 ± 0.39	4.62 ± 0.27	2.15 ± 0.13
Stature	65	1588–1816	1706.46 ± 0.40	4.77 ± 0.28	2.80 ± 0.17
Sitting height	65	775–914	853.57 ± 2.45	29.32 ± 1.73	3.43 ± 0.20
Head length	65	168–190	181.12 ± 0.42	5.02 ± 0.30	2.77 ± 0.16
Head breadth	65	132–156	143.06 ± 0.46	5.52 ± 0.33	3.86 ± 0.23
Minimum frontal diameter	65	107–122	112.88 ± 0.28	3.40 ± 0.20	3.01 ± 0.18
Bizygomatic breadth	65	123–143	133.08 ± 0.36	4.35 ± 0.26	3.27 ± 0.19
Bigonial breadth	64	98–120	109.36 ± 0.40	4.77 ± 0.28	4.36 ± 0.26
Total facial height	65	107–135	120.09 ± 0.49	5.88 ± 0.35	4.90 ± 0.29
Upper facial height	65	59–78	69.68 ± 0.39	4.66 ± 0.28	6.69 ± 0.40
Nasal height	65	42–60	51.12 ± 0.32	3.83 ± 0.23	7.49 ± 0.44
Nasal breadth	65	29–42	35.78 ± 0.19	2.26 ± 0.13	6.32 ± 0.37
Ear length	65	48–70	59.17 ± 0.39	4.65 ± 0.28	7.86 ± 0.46
Ear breadth	65	30–43	35.89 ± 0.21	2.51 ± 0.15	6.99 ± 0.41
Indices					
Relative sitting height	65	47–53	50.02 ± 0.11	1.37 ± 0.08	2.74 ± 0.16
Cephalic	65	72–87	79.08 ± 0.34	4.11 ± 0.24	5.20 ± 0.31
Fronto-parietal	65	70–86	78.92 ± 0.25	3.03 ± 0.18	3.84 ± 0.23
Cephalic-facial	65	86–101	93.14 ± 0.29	3.46 ± 0.20	3.71 ± 0.22
Zygo-frontal	65	79–92	84.77 ± 0.20	2.45 ± 0.14	2.89 ± 0.17
Fronto-gonial	64	88–107	96.98 ± 0.33	3.91 ± 0.23	4.03 ± 0.24
Zygo-gonial	65	77–108	82.55 ± 0.36	4.31 ± 0.25	5.22 ± 0.31
Total facial	65	83–100	90.32 ± 0.37	4.48 ± 0.27	4.96 ± 0.29
Upper facial	65	45–60	52.31 ± 0.30	3.62 ± 0.21	6.92 ± 0.41
Nasal	65	57–89	70.40 ± 0.56	6.75 ± 0.40	9.59 ± 0.57
Ear	65	46–81	61.00 ± 0.48	5.72 ± 0.34	9.38 ± 0.55

13 BALUCHIS IN KALAT (GROUP D)

TABLE 66. AGE DISTRIBUTION

Age	#
17–19	0
20–24	5
25–29	1
30–34	2
35–39	2
40–44	2
45–49	1
50–54	0
55–59	0
60–64	0

TABLE 67. WEIGHT

Group	#
101–110	1
111–120	3
121–130	2
131–140	3
141–150	3
151–160	1

TABLE 68. SKIN COLOR

Forehead	#
Brunet	6
Swarthy	7

TABLE 69. FRECKLES

Group	#
Absent	1
Sub-medium	8
Medium	1

TABLE 70. MOLES

Group	#
Absent	5
Few	4

TABLE 71. HAIR

	#
Color, Head	
Dark brown	13
Color, Beard or Mustache	
Dark brown	12
Golden brown	1
Form	
Low waves	9
Deep waves	2
Curly	2
Texture	
Coarse	2
Medium	8
Fine	3
Baldness	
Absent	13
Grayness, Head	
Absent	11
Sub-medium	2
Grayness, Beard or Mustache	
Absent	11
Sub-medium	2

TABLE 72. EYES

	#
Color	
Dark brown	13
Iris	
Clear	11
Spotted	2

TABLE 73. NOSE

	#
Profile	
Concave	4
Straight	6
Convex	3
Wavy	0
Tip Thickness	
Sub-medium	4
Medium	8
Pronounced	1
Wings	
Compressed	2
Medium	10
Flaring	1

TABLE 74. EARS

Lobe	#
Attached	12

TABLE 74. (*Continued*)

Lobe, Size	#
Sub-medium	9
Medium	3
Pronounced	1
Protrusion	
Sub-medium	1
Medium	12

TABLE 75. STATURE

Harvard System	#
Short (x–160.5)	1
Medium (160.6–169.4)	6
Tall (169.5–x)	6
Keith System	
Short (x–159.9)	1
Medium (160.6–169.9)	6
Tall (170.0–179.9)	6
Very tall (180.0–x)	0

TABLE 76. HEAD MEASUREMENTS AND INDICES

Head Breadth	#
Very narrow (120–129))	0
Narrow (130–139)	7
Wide (140–149)	5
Very wide (150–x)	1
Minimum Frontal Diameter	
Very narrow (x–99)	0
Narrow (100–109)	11
Wide (110–119)	1
Very wide (120–x)	1
Cephalic Index	
Harvard System	
Dolichocephalic (x–76.5)	5
Mesocephalic (76.6–82.5)	6
Brachycephalic (82.6–x)	2
Keith System	#
Ultradolichocephalic (x–70.0)	0
Dolichocephalic (70.1–75.0)	3
Mesocephalic (75.1–79.9)	5
Brachycephalic (80.0–84.9)	5
Ultrabrachycephalic (85.0–x)	0

TABLE 77. FACIAL MEASUREMENTS AND INDICES

Upper Facial Height	#
Short (x–63)	3
Medium short (64–69)	4
Medium long (70–75)	6
Long (76–x)	0
Total Facial Height	
Short (x–109)	2
Medium short (110–119)	1
Medium long (120–129)	9
Long (130–x)	1
Total Facial Index	
Euryprosopic (x–84.5)	0
Mesoprosopic (84.6–89.4)	2
Leptoprosopic (89.5–x)	11

TABLE 78. NASAL MEASUREMENTS AND INDICES

Nasal Height	#
Short (x–49)	3
Medium (50–59)	10
Long (60–x)	0
Nasal Breadth	
Very narrow (x–29)	0
Medium narrow (30–35)	5
Medium wide (36–41)	8
Wide (42–x)	0
Nasal Index	
Leptorrhine (x–67.4)	2
Mesorrhine (67.5–83.4)	10
Platyrrhine (83.5–x)	1

TABLE 79. MEASUREMENTS AND INDICES OF 13 BALUCHIS IN KALAT (GROUP D)

Measurements	*No.*	*Range*	*Mean*	*S.D.*	*C.V.*
Age	13	20–45	29.23 ± 1.64	8.77 ± 1.16	3.00 ± 0.40
Weight	13	106–160	130.54 ± 0.27	1.45 ± 0.19	1.11 ± 0.15
Stature	13	1575–1778	1682.31 ± 1.06	5.64 ± 0.75	3.35 ± 0.44
Head length	13	172–196	182.08 ± 1.29	6.92 ± 0.92	3.80 ± 0.50
Head breadth	13	137–152	141.54 ± 0.82	4.38 ± 0.58	3.10 ± 0.41
Minimum frontal diameter	13	103–125	108.85 ± 1.04	5.54 ± 0.73	5.09 ± 0.67

TABLE 79. (*Continued*)

	No.	*Range*	*Mean*	*S.D.*	*C.V.*
Bizygomatic breadth	13	121–134	128.31 ± 0.75	4.00 ± 0.53	3.12 ± 0.41
Bigonial breadth	13	97–120	107.85 ± 1.04	5.54 ± 0.73	5.13 ± 0.68
Total facial height	13	103–132	120.00 ± 1.37	7.31 ± 0.97	6.09 ± 0.81
Upper facial height	13	61–73	68.00 ± 0.73	3.92 ± 0.52	5.76 ± 0.76
Nasal height	13	45–57	49.92 ± 0.62	3.17 ± 0.44	6.35 ± 0.87
Nasal breadth	13	33–39	36.54 ± 0.29	1.54 ± 0.20	4.21 ± 0.56
Ear length	13	52–62	56.69 ± 0.56	3.00 ± 0.40	5.29 ± 0.70
Ear breadth	13	31–42	35.69 ± 0.55	2.92 ± 0.39	8.18 ± 1.08
Indices					
Cephalic	13	72–84	77.77 ± 0.69	3.69 ± 0.49	4.74 ± 0.63
Fronto-parietal	13	70–88	76.85 ± 0.91	4.85 ± 0.64	6.31 ± 0.83
Cephalic-facial	13	84–96	90.85 ± 0.79	4.23 ± 0.56	4.66 ± 0.62
Zygo-frontal	13	79–94	84.85 ± 0.68	3.62 ± 0.48	4.27 ± 0.56
Fronto-gonial	13	84–111	99.23 ± 1.24	6.62 ± 0.88	6.67 ± 0.88
Zygo-gonial	13	79–92	83.92 ± 0.68	3.62 ± 0.48	4.31 ± 0.57
Total facial	13	85–101	93.54 ± 0.86	4.62 ± 0.61	4.94 ± 0.65
Upper facial	13	48–57	53.00 ± 0.48	2.54 ± 0.34	4.79 ± 0.63
Nasal	13	63–90	74.69 ± 1.25	6.69 ± 0.88	8.96 ± 1.18
Ear	13	52–71	63.15 ± 0.88	4.69 ± 0.62	7.43 ± 0.98

86 BRAHUIS IN KALAT (GROUP E)

TABLE 80. AGE DISTRIBUTION

Age	#	%
17–19	9	10.47
20–24	18	20.93
25–29	16	18.60
30–34	16	18.60
35–39	13	15.12
40–44	11	12.79
45–49	3	3.49
50–54	0	....
55–59	0	....
60–64	0	....
Total	86	100.00

TABLE 81. WEIGHT

Group	#	%
101–110	11	12.94
111–120	15	17.65
121–130	36	42.35
131–140	16	18.82
141–150	5	5.88
151–160	1	1.18
161–170	0	....
171–180	0	....
181–190	1	1.18
Total	85	100.00

TABLE 82. SKIN COLOR

Forehead	#	%
Brunet	56	65.12
Swarthy	30	34.88
Total	86	100.00

TABLE 83. FRECKLES

Group	#	%
Absent	41	50.00
Sub-medium	34	41.46
Medium	7	8.54
Total	82	100.00

TABLE 84. MOLES

Group	#	%
Absent	47	58.75
Few	31	38.75
Many	2	2.50
Total	80	100.00

TABLE 85. HAIR

Color, Head	#	%
Dark brown	85	98.84
Brown	1	1.16
Total	86	100.00

TABLE 85. (*Continued*)

	#	%
Color, Beard or Mustache		
Dark brown	84	97.67
Golden brown	2	2.33
Total	86	100.00
Form		
Low waves	67	80.72
Deep waves	16	19.28
Total	83	100.00
Texture		
Coarse	6	7.06
Medium	55	64.71
Fine	24	28.24
Total	85	100.01
Hair Quantity, Head		
Medium	11	84.62
Pronounced	2	15.38
Total	13	100.00
Hair Quantity, Beard or Mustache		
Very small	2	11.76
Sub-medium	7	41.18
Medium	8	47.06
Total	17	100.00
Grayness, Head		
Absent	64	74.42
Sub-medium	19	22.09
Medium	3	3.49
Total	86	100.00
Grayness, Beard		
Absent	63	80.77
Sub-medium	14	17.95
Medium	1	1.28
Total	78	100.00

TABLE 86. EYES

	#	%
Color		
Black	1	1.16
Dark brown	69	80.23
Light brown	11	12.79
Dark-light brown	2	2.33
Green-brown	2	2.33
Gray-blue	1	1.16
Total	86	100.00
Iris		
Clear	63	75.00
Rayed	4	4.76
Zoned	1	1.19
Spotted	16	19.05
Total	84	100.00

TABLE 87. NOSE

	#	%
Profile		
Concave	19	22.09
Straight	15	17.44
Convex	52	60.47
Wavy	0	....
Total	86	100.00
Tip Thickness		
Sub-medium	46	53.49
Medium	32	37.21
Pronounced	6	6.98
Very pronounced	2	2.33
Total	86	100.01
Wings		
Compressed	34	39.53
Medium	48	55.81
Flaring	4	4.65
Total	86	99.99

TABLE 88. TEETH

	#	%
Bite		
Edge-to-edge	0	....
Sub-medium over	30	96.77
Pronounced over	1	3.24
Total	31	100.01
Loss		
None	22	70.97
Very small	8	25.81
Sub-medium	1	3.24
Total	31	100.02
Wear		
Absent	10	31.25
Medium	13	40.63
Pronounced	9	28.13
Total	32	100.01
Crowding		
Absent	29	96.67
Medium	1	3.33
Total	30	100.00
Eruption		
Complete	20	64.52
Partial	11	35.48
Total	31	100.00

TABLE 89. EARS

	#	%
Lobe		
Soldered	3	3.49
Attached	82	95.35
Free	1	1.16
Total	86	100.00
Lobe, Size		
Sub-medium	56	65.12
Medium	30	34.88
Total	86	100.00
Protrusion		
Sub-medium	20	23.53
Medium	63	74.12
Pronounced	2	2.35
Total	85	100.00

TABLE 90. STATURE

	#	%
Harvard System		
Short (x–160.5)	6	7.06
Medium (160.6–169.4)	35	41.18
Tall (169.5–x)	44	51.76
Total	85	100.00
Keith System		
Short (x–159.9)	4	4.71
Medium (160.0–169.9)	37	43.53
Tall (170.0–179.9)	40	47.06
Very tall (180.0–x)	4	4.71
Total	85	100.01

TABLE 91. HEAD MEASUREMENTS AND INDICES

	#	%
Head Breadth		
Very narrow (120–129)	4	4.65
Narrow (130–139)	35	40.70
Wide (140–149)	41	47.67
Very wide (150–x)	6	6.98
Total	86	100.00
Minimum Frontal Diameter		
Very narrow (x–99)	0	....
Narrow (100–109)	29	33.72
Wide (110–119)	52	60.47
Very wide (120–x)	5	5.81
Total	86	100.00
Cephalic Index		
Harvard System		
Dolichocephalic (x–76.5)	39	45.35
Mesocephalic (76.6–82.5)	39	45.35
Brachycephalic (82.6–x)	8	9.30
Total	86	100.00
Keith System		
Ultradolichocephalic (x–70.0)	4	4.65
Dolichocephalic (70.1–75.0)	30	34.88
Mesocephalic (75.1–79.9)	28	32.56
Brachycephalic (80.0–84.9)	19	22.09
Ultrabrachycephalic (85.0–x)	5	5.81
Total	86	99.99

TABLE 92. FACIAL MEASUREMENTS AND INDICES

	#	%
Upper Facial Height		
Short (x–63)	9	10.47
Medium short (64–69)	19	22.09
Medium long (70–75)	32	37.21
Long (76–x)	26	30.23
Total	86	100.00
Total Facial Height		
Short (x–109)	2	2.33
Medium short (110–119)	30	34.88
Medium long (120–129)	44	51.16
Long (130–x)	10	11.63
Total	86	100.00
Total Facial Index		
Euryprosopic (x–84.5)	3	3.49
Mesoprosopic (84.6–89.4)	20	23.26
Leptoprosopic (89.5–x)	63	73.26
Total	86	100.01

TABLE 93. NASAL MEASUREMENTS AND INDICES

	#	%
Nasal Height		
Short (x–49)	16	18.60
Medium (50–59)	65	75.58
Long (60–x)	5	5.81
Total	86	99.99
Nasal Breadth		
Very narrow (x–29)	0	....
Medium narrow (30–35)	22	25.58
Medium wide (36–41)	52	60.47
Wide (42–x)	12	13.95
Total	86	100.00
Nasal Index		
Leptorrhine (x–67.4)	44	51.16
Mesorrhine (67.5–83.4)	38	44.19
Platyrrhine (83.5–x)	4	4.65
Total	86	100.00

TABLE 94. STATISTICAL ANALYSES OF 86 BRAHUIS IN KALAT (GROUP E)

Minimum Frontal Diameter

Head Breadth	*x–99*		*100–109*		*110–119*		*120–x*		*Total*	
	#	%	#	%	#	%	#	%	#	%
120–129	0	....	3	3.49	1	1.16	0	....	4	4.65
130–139	0	....	18	20.93	17	19.77	0	....	35	40.70
140–149	0	....	8	9.30	30	34.88	3	3.49	41	47.67
150–x	0	....	0	....	4	4.65	2	2.33	6	6.98
Total	0	0	29	33.72	52	60.46	5	5.82	86	100.00

Bizygomatic Diameter

Total Facial Height	*x–124*		*125–134*		*135–x*		*Total*	
	#	%	#	%	#	%	#	%
x–114	0	....	5	5.81	1	1.16	6	6.97
115–124	3	3.49	36	41.86	8	9.30	47	54.65
125–x	0	....	23	26.74	10	11.63	33	38.37
Total	3	3.49	64	84.41	19	22.09	86	99.99

Upper Facial Height

Total Facial Height	*x–63*		*64–69*		*70–75*		*76–81*		*82–x*		*Total*	
	#	%	#	%	#	%	#	%	#	%	#	%
x–109	0	....	1	1.16	0	....	0	....	0	....	1	1.16
110–119	3	3.49	16	18.60	9	10.47	2	2.33	0	....	30	34.89
120–129	0	....	7	8.14	26	30.23	11	12.79	1	1.16	45	52.32
130–x	0	....	1	1.16	2	2.33	7	8.14	0	....	10	11.63
Total	3	3.49	25	29.06	37	43.23	20	23.26	1	1.16	86	100.00

Nasal Breadth

Nasal Height	*x–29*		*30–35*		*36–41*		*42–x*		*Total*	
	#	%	#	%	#	%	#	%	#	%
x–49	0	....	7	8.14	7	8.14	2	2.33	16	18.61
50–59	0	....	19	22.09	42	48.84	4	4.65	65	75.58
60–x	0	....	3	3.49	2	2.33	0	....	5	5.82
Total	0	0	29	33.72	51	59.31	6	6.98	86	100.01

TABLE 95. MEASUREMENTS AND INDICES OF 86 BRAHUIS IN KALAT (GROUP E)

Measurements	*No.*	*Range*	*Mean*	*S.D.*	*C.V.*
Age	86	18–45	28.77 ± 0.56	7.64 ± 0.40	2.66 ± 0.14
Weight	86	102–192	126.37 ± 0.10	1.43 ± 0.07	1.13 ± 0.06
Stature	85	1473–1854	1693.55 ± 0.44	6.06 ± 0.31	3.58 ± 0.19
Head length	86	168–196	183.29 ± 0.46	6.34 ± 0.33	3.46 ± 0.18
Head breadth	86	124–162	141.00 ± 0.45	6.12 ± 0.31	4.34 ± 0.22
Minimum frontal diameter	86	102–130	112.02 ± 0.35	4.80 ± 0.25	4.29 ± 0.22
Bizygomatic breadth	86	115–146	131.67 ± 0.33	4.53 ± 0.23	3.44 ± 0.18
Bigonial breadth	86	94–128	109.24 ± 0.44	5.99 ± 0.31	5.49 ± 0.28
Total facial height	86	108–137	122.74 ± 0.44	6.05 ± 0.31	4.93 ± 0.25
Upper facial height	86	62–83	71.71 ± 0.34	4.62 ± 0.24	6.44 ± 0.33
Nasal height	85	43–66	52.80 ± 0.32	4.32 ± 0.22	8.18 ± 0.42
Nasal breadth	86	30–44	36.56 ± 0.21	2.88 ± 0.15	7.88 ± 0.41
Ear length	85	50–72	59.39 ± 0.34	4.60 ± 0.24	7.75 ± 0.40
Ear breadth	85	30–42	36.33 ± 0.20	2.75 ± 0.14	7.57 ± 0.39

Table 95. (*Continued*)

	No.	Range	Mean	S.D.	C.V.
Indices					
Cephalic	86	69–88	77.09 ± 0.29	4.03 ± 0.21	5.23 ± 0.27
Fronto-parietal	86	70–91	79.56 ± 0.25	3.41 ± 0.18	4.29 ± 0.22
Cephalic-facial	86	82–103	93.49 ± 0.28	3.81 ± 0.20	4.08 ± 0.21
Zygo-frontal	86	78–94	85.21 ± 0.21	2.93 ± 0.15	3.44 ± 0.18
Fronto-gonial	86	85–108	97.60 ± 0.36	4.92 ± 0.25	5.04 ± 0.26
Zygo-gonial	86	74–93	83.07 ± 0.27	3.74 ± 0.19	4.50 ± 0.23
Total facial	86	82–106	93.33 ± 0.37	5.05 ± 0.26	5.41 ± 0.28
Upper facial	86	47–62	54.50 ± 0.26	3.59 ± 0.18	6.59 ± 0.34
Nasal	82	52–83	68.72 ± 0.47	6.34 ± 0.33	9.23 ± 0.49
Ear	85	51–79	61.40 ± 0.37	5.05 ± 0.26	8.22 ± 0.43

Table 96. Measurements and Indices of 85 Baluchis (Groups A + B + D)

	No.	Range	Mean	S.D.	C.V.
Measurements					
Age	85	18–45	28.32 ± 0.56	7.64 ± 0.40	2.70 ± 0.14
Stature	85	1562–1829	1682.28 ± 0.44	6.08 ± 0.31	3.61 ± 0.19
Head length	84	164–197	178.39 ± 0.50	6.86 ± 0.36	3.85 ± 0.20
Head breadth	84	134–160	145.31 ± 0.45	6.15 ± 0.32	4.23 ± 0.22
Minimum frontal diameter	84	102–127	111.50 ± 0.37	4.98 ± 0.26	4.47 ± 0.23
Bizygomatic breadth	84	113–142	130.94 ± 0.41	5.54 ± 0.29	4.23 ± 0.22
Bigonial breadth	82	96–124	106.83 ± 0.41	5.46 ± 0.29	5.11 ± 0.27
Total facial height	84	103–142	121.81 ± 0.51	6.88 ± 0.36	5.65 ± 0.29
Upper facial height	84	61–85	72.52 ± 0.37	5.02 ± 0.26	6.92 ± 0.36
Nasal height	83	44–67	53.24 ± 0.33	4.41 ± 0.23	8.28 ± 0.43
Nasal breadth	84	24–44	36.20 ± 0.20	2.69 ± 0.14	7.43 ± 0.39
Ear length	82	45–74	58.89 ± 0.41	5.51 ± 0.29	9.36 ± 0.49
Ear breadth	82	31–42	36.15 ± 0.19	2.55 ± 0.13	7.05 ± 0.37
Indices					
Cephalic	84	72–93	81.58 ± 0.33	4.48 ± 0.23	5.49 ± 0.29
Fronto-parietal	84	68–92	76.88 ± 0.31	4.23 ± 0.22	5.50 ± 0.29
Cephalic-facial	84	82–102	90.24 ± 0.29	3.95 ± 0.21	4.38 ± 0.23
Zygo-frontal	84	78–109	85.30 ± 0.32	4.33 ± 0.23	5.08 ± 0.26
Fronto-gonial	83	81–113	96.06 ± 0.40	5.45 ± 0.29	5.67 ± 0.30
Zygo-gonial	82	72–96	81.60 ± 0.31	4.21 ± 0.22	5.16 ± 0.27
Total facial	84	83–109	93.08 ± 0.39	5.32 ± 0.28	5.72 ± 0.30
Upper facial	84	48–63	55.46 ± 0.27	3.65 ± 0.19	6.58 ± 0.34
Nasal	83	48–90	68.70 ± 0.57	7.73 ± 0.40	11.25 ± 0.59
Ear	82	49–79	61.87 ± 0.44	5.87 ± 0.31	9.49 ± 0.50

Table 97. Measurements and Indices of 151 Brahuis (Group C + E)

	No.	Range	Mean	S.D.	C.V.
Measurements					
Age	151	18–45	25.64 ± 0.41	7.44 ± 0.29	2.90 ± 0.11
Stature	150	1473–1854	1699.15 ± 0.31	5.57 ± 0.22	3.28 ± 0.13
Head length	151	168–196	182.36 ± 0.32	5.90 ± 0.23	3.23 ± 0.13
Head breadth	151	124–162	141.89 ± 0.33	5.95 ± 0.23	4.19 ± 0.16
Minimum frontal diameter	151	102–130	112.39 ± 0.23	4.28 ± 0.17	3.81 ± 0.15
Bizygomatic breadth	151	117–146	132.28 ± 0.25	4.52 ± 0.18	3.42 ± 0.13
Bigonial breadth	150	94–128	109.29 ± 0.30	5.50 ± 0.21	5.03 ± 0.20
Total facial height	151	108–137	121.60 ± 0.34	6.11 ± 0.24	5.02 ± 0.19

TABLE 97. (*Continued*)

	No.	*Range*	*Mean*	*S.D.*	*C.V.*
Upper facial height ..	151	59–82	70.83 ± 0.26	4.75 ± 0.18	6.71 ± 0.26
Nasal height	150	42–66	52.07 ± 0.23	4.19 ± 0.16	8.05 ± 0.31
Nasal breadth	151	29–44	36.23 ± 0.15	2.66 ± 0.10	7.34 ± 0.28
Ear length	150	48–72	59.29 ± 0.25	4.62 ± 0.18	7.79 ± 0.30
Ear breadth	150	30–43	36.14 ± 0.15	2.65 ± 0.10	7.33 ± 0.29
Indices					
Cephalic	151	69–88	77.95 ± 0.23	4.18 ± 0.16	5.36 ± 0.21
Fronto-parietal	151	70–91	79.28 ± 0.18	3.26 ± 0.13	4.11 ± 0.16
Cephalic-facial	151	82–103	93.34 ± 0.20	3.68 ± 0.14	3.94 ± 0.15
Zygo-frontal	151	78–94	85.02 ± 0.15	2.74 ± 0.11	3.22 ± 0.12
Fronto-gonial	150	85–108	97.34 ± 0.25	4.52 ± 0.18	4.64 ± 0.18
Zygo-gonial	151	74–108	82.85 ± 0.22	4.01 ± 0.16	4.84 ± 0.19
Total facial	151	82–106	92.03 ± 0.28	5.04 ± 0.20	5.48 ± 0.21
Upper facial	151	45–61	53.56 ± 0.21	3.76 ± 0.15	7.02 ± 0.27
Nasal	147	52–89	69.46 ± 0.37	6.59 ± 0.26	9.49 ± 0.37
Ear	150	46–81	61.23 ± 0.29	5.35 ± 0.21	8.74 ± 0.34

TABLE 98. STATURE AND CEPHALIC INDICES OF 5 GROUPS

Stature

	TURBAT		*PANJGUR*				*KALAT*			
	Baluchis		*Brahuis*		*Baluchis*		*Brahuis*		*Baluchis*	
Harvard System										
Short (x–160.5)	8	23.53	3	4.62	0	....	6	7.06	1	7.69
Med. (160.6–169.4)	21	61.76	26	40.00	13	34.21	35	41.18	6	46.15
Tall (169.5–x)	5	14.71	36	55.38	25	65.79	44	51.76	6	46.15
	34	100.00	65	100.00	38	100.00	85	100.00	13	99.99
Keith System										
Short (x–159.9)	3	8.82	1	1.54	0	....	4	4.71	1	7.69
Med. (160.0–169.9)	26	76.47	28	43.08	13	34.21	37	43.53	6	46.15
Tall (170.0–179.9)	5	14.71	34	52.31	22	57.89	40	47.06	6	46.15
Very tall (180.0–x)	0	....	2	3.08	3	7.89	4	4.71	0	....
	34	100.00	65	100.01	38	99.99	85	100.01	13	99.99
Cephalic Index										
Harvard System										
Dol. (x–76.5)	4	11.76	18	27.69	2	5.41	39	45.35	5	38.46
Meso. (76.6–82.5)	18	52.94	32	49.23	17	45.95	39	45.35	6	46.15
Brach. (82.6–x)	12	35.29	15	23.08	18	48.65	8	9.30	2	15.38
	34	99.99	65	100.00	37	100.01	86	100.00	13	99.99
Keith System										
Ultradol. (x–70.0)	0	....	0	....	0	....	4	4.65	0	....
Dol. (70.1–75.0)	2	5.88	15	23.08	1	2.70	30	34.88	3	23.08
Meso. (75.1–79.9)	8	23.53	17	26.15	6	16.22	28	32.56	5	38.46
Brach. (80.0–84.9)	14	41.18	28	43.08	19	51.35	19	22.09	5	38.46
Ultrabr. (85.0–x)	10	29.41	5	7.69	11	29.73	5	5.81	0	....
	34	100.00	65	100.00	37	100.00	86	99.99	13	100.00

Table 99. F Ratio for Relative Heterogeneity

Measurement	*Among 5 Baluchistan Groups*		*Baluchis I A+B+D*		*Brahuis II C+E*		*Combined I vs II*	
Stature	9.32	***	16.28	***	1.98	—	4.61	*
Head length	9.29	***	4.26	—	5.00	*	21.46	***
Head breadth	9.36	***	7.47	***	4.50	*	17.25	***
Minimum frontal diameter	2.29	—	2.41	—	1.47	—	2.07	—
Bizygomatic breadth	3.86	**	3.29	*	3.57	—	3.96	*
Bigonial breadth	3.41	**	1.54	—	0.0	—	10.61	**
Total facial height	5.51	***	6.89	**	7.23	**	0.05	—
Upper facial height	7.28	***	7.50	***	7.02	**	6.50	*
Nasal height	5.16	***	5.12	**	6.01	*	3.97	*
Nasal breadth	2.92	*	4.37	*	3.13	—	0.0	—

—	No significance
*	Probably significant (P 5%)
**	Significant (P 1%)
***	Highly significant (P 1/10%)

Table 100. Measurements and Indices of Miscellaneous Series in Kalat (Group F)

	No.	*Range*	*Mean*	*S.D.*	*C.V.*
Measurements					
Age	39	18–45	25.56 ± 0.78	7.23 ± 0.55	2.83 ± 0.22
Weight	39	102–172	128.00 ± 0.17	1.60 ± 0.12	1.25 ± 0.10
Stature	39	1549–1854	1685.90 ± 0.75	6.91 ± 0.53	4.10 ± 0.31
Head length	39	167–195	179.77 ± 0.71	6.54 ± 0.50	3.64 ± 0.28
Head breadth	39	128–155	141.21 ± 0.59	5.46 ± 0.42	3.87 ± 0.30
Minimum frontal diameter	39	98–118	110.46 ± 0.52	4.85 ± 0.37	4.39 ± 0.34
Bizygomatic breadth	39	123–142	131.13 ± 0.48	4.44 ± 0.34	3.39 ± 0.26
Bigonial breadth	39	97–117	107.00 ± 0.51	4.74 ± 0.36	4.43 ± 0.34
Total facial height	39	108–139	122.85 ± 0.71	6.62 ± 0.51	5.39 ± 0.41
Upper facial height	38	64–83	71.61 ± 0.54	4.97 ± 0.38	6.94 ± 0.54
Nasal height	39	43–67	52.38 ± 0.51	4.72 ± 0.36	9.01 ± 0.69
Nasal breadth	39	32–46	37.59 ± 0.36	3.36 ± 0.26	8.94 ± 0.68
Ear length	39	50–67	58.21 ± 0.47	4.33 ± 0.33	7.44 ± 0.57
Ear breadth	39	28–43	35.64 ± 0.32	2.92 ± 0.22	8.19 ± 0.63
Indices					
Cephalic	39	69–88	78.74 ± 0.47	4.31 ± 0.33	5.47 ± 0.42
Fronto-parietal	39	67–84	76.13 ± 0.40	3.69 ± 0.28	4.72 ± 0.36
Cephalic-facial	39	85–100	92.85 ± 0.45	4.13 ± 0.32	4.45 ± 0.34
Zygo-frontal	39	78–90	84.31 ± 0.33	3.05 ± 0.23	3.62 ± 0.28
Fronto-gonial	39	90–110	96.97 ± 0.48	4.44 ± 0.34	4.58 ± 0.35
Zygo-gonial	39	76–92	81.72 ± 0.38	3.51 ± 0.27	4.30 ± 0.33
Total facial	39	85–104	93.69 ± 0.47	4.31 ± 0.33	4.60 ± 0.35
Upper facial	38	49–61	54.68 ± 0.38	3.47 ± 0.27	6.35 ± 0.49
Nasal	39	58–88	72.18 ± 0.81	7.46 ± 0.57	10.34 ± 0.79
Ear	39	49–79	61.64 ± 0.75	6.92 ± 0.53	11.23 ± 0.86

Chapter VII

BAHAWALPUR

THE LAND AND THE PEOPLE

AT THE close of the last century the area of Bahawalpur State differed from that following Partition in 1947.

In 1900, it was described in the *Gazetteer* as lying to the southwest of the Punjab and northeast of Sind, and forming a connecting link between the two provinces. It was bounded on the north and west, first by the Sutlej which separated it from the Montgomery and Multan Districts of the Punjab, then by the combined waters of the Sutlej and Chenab which separated it from the Muzaffargarh District of the Punjab, and finally, from the point where the joint streams met the Indus, by the Indus which divided it from the Punjab District of Dera Ghazi Khan and that of Jacobabad in Sind. On the northeast lay the District of Ferozepur and on the south the independent States of Bikanir and Jaisalmer, and the Province of Sind.

According to the Revenue Survey, the gross area of the State was 15,918 square miles, of which 9,881 were desert, and this great tract was about 300 miles in length from northeast to southwest with river borders of 180 miles on the Sutlej; 40 miles on the Chenab or Panjnad, below the confluence of the "Five Rivers"; and 70 miles on the Indus.

Physical Features

The mean breadth was 50 miles, divided geographically into 3 strips running parallel to each other throughout the whole length of the State. These strips may be described as:

a) Part of the Great Indian Desert was bounded on the north and west by a depression known as the Haqra (Huqra). Its surface consists of a succession of sand dunes, rising in places to a height of 500 feet, with the vegetation peculiar to sandy tracts. There is no soil down to the lowest depth penetrated by wells; all is sand, but bitter water is encountered at a depth of 80 feet. Wells are sunk through a stratum of fine sand, the sides being sustained by a steaning of gypsum plaster, 3 inches thick, which is added as the excavation proceeds. These wells are seldom more than from 3–4 feet in diameter, and, even with the precaution of steaning, their excavation is regarded as a perilous adventure. Overlying the sand in many of the valleys, as at Ghauspur, Rukanpur and Khangarh, is found a deposit of amorphous sulphate of lime from 3–6 feet thick. This tract is called the Rohi or Cholistan.

b) The central tract is identical in character with the uplands running from the Sulaiman Range across the Derajat and Western Punjab, where it is locally known as the Pat or Bar and through which each of the Punjab rivers has cut its own valley. The difference of soil in the valleys and uplands is unmistakable. The former is a micaceous soil with alternating layers of light bluish silt, and the latter a stiff clay mixed with sand.

The limit of this central tract on the river side is clearly defined by a line of sand hills, and on the northeast portion of the State by an abrupt transition to the lower valley, which in many places is 30 feet below it. However, this difference gradually fades away as we proceed to the southwestern boundary where the surface of the central tract is from 18–20 feet below the cold weather zero of the river Indus.

Below spring water level in both tracts the substratum is identical, being a light bluish colored silt, the counterpart of the silt deposited by the rivers. The edge of the high central tract is cut out by a series of indentations, proving the former action of running water. Up to this point the soil of the alluvial tract is identical with that found on the banks of the rivers, except a few isolated tracts which have never been affected by river action. However, above this point the alluvium of the high land differs, this being the limit beyond which none of the Punjab rivers have ever flowed under existing conditions.

The well water in (*a*) and (*b*) is impregnated with various salts in solution, among which sodium sulphate is present to a large extent. When the wells are not used and the water is allowed to stagnate, the excess of salt makes the water very offensive and undrinkable until the stagnant water has been replenished. The depth of spring water below the surface of the ground increases in proportion to the distance from the rivers, but in a greater ratio to the northeast than toward the southwest. In the eastern portion, the subterranean spring level falls at the rate of 38 inches per mile, while at its confluence with the Chenab the fall is only 17½ inches per mile.

The fall of the country up to the edge of the central tract is about a foot per mile from north to south, and from 12–15 inches a mile from east to west, while the slope of the beds of the rivers does not generally exceed 8 inches per mile. The rivers have, therefore, to adjust their beds to the slope of the country and are forced to meander, often with horseshoe bends. On account of the greater slope of the country, the Sutlej meanders more than either the Chenab or the Indus.

During the inundation season, the floods spread over the adjoining country and as soon as the river falls, the stream takes the shortest course and in many cases joins the two ends of the horseshoe curve, which are soon closed, leaving a deep depression in the middle. The land lying within this depression is thus transferred from the right bank of the river to the left, or vice versa. Some years later, should the set of the river again turn toward the deserted channel, as soon as the bank which marks the channel is removed the river returns to its old bed—and again a transfer of a portion of the enclosed lands takes place. In fact, these changes occur only when the river makes a horseshoe bend or returns to a deserted channel.

The alluvial tract above referred to is scored throughout its whole length by deep depressions, generally horseshoe curves, showing where, at some former period, one of the rivers must have been. These depressions are from 6–12 feet deep and from 50–100 feet broad. They have been left deserted because of the westering tendency of all the great Punjab rivers. The rise of the country from the edge of the central tract to the present bed of the rivers shows that the earliest course of both the Sutlej and Indus was along the edge of the central tract, and that they have worked northward and westward to their present positions. This tract is called the Sind.

It will be clear from this description that the lie of the land in the southwestern Punjab does not favor the formation of deep, well-defined and permanent beds by the great rivers, which converge in the valley of the Indus, but permits constant and sometimes sudden changes in their courses. This tendency has apparently been accentuated by the slow but never-ceasing drift of sand from the Great Indian Desert on the south and, as Minchin thought possible, by some upheaval of the tracts on its border. The subject is so important for a clear understanding of the ancient geography of Bahawalpur, of its history and modern development, that it will be discussed here at some length.

That the course of each of the great rivers has been changed within historical times is conceded on all sides, but the precise nature of those changes has been the subject of controversy and still remains undecided. The main question is as to what river flowed in the great depression, called the Haqra, which forms the southeastern frontier of the State, separating it from the Rajputana Desert and the State of Jaisalmer.

As to the Haqra depression, several theories have been advanced. Writing in the *Calcutta Review* in 1874, Surgeon Major C. F. Oldham ingeniously suggested that the Haqra, the upper part of which is called the Sotra (Sutra), probably a corruption of Satodra (Sutudri), is the old bed of the Sutlej (Satadru). This theory was vigorously combatted by "Nearchus," in an article in the *Calcutta Review* in 1875, who held that the Haqra was fed by both the Sutlej and the Jumna, but did not form the main bed of either of those great rivers, the existing bed of the Haqra being too narrow for it to have ever formed a river of their magnitude, and its level being some 30 feet above that of the present Sutlej. Colonel Minchin, who was for many years Political Agent in Bahawalpur, advanced the theory that the Haqra is the old bed of the Jumna, and his reasons pursue the following lines.

The desert section is divided from the central tract by a depression called the Haqra, but in the southern portion of Bahawalpur the advance of the sand hills blown across from the Great Indian Desert has almost obliterated all traces of this river bed.

Minchin comments in the *Calcutta Review* for July, 1874 that an attempt was made to prove that this lost river was at one period the Sutlej. In his opinion the fact that the river Sutlej flowed within a defined valley of its own, bounded on either side by lands so much higher in level and of so different a character, precludes the idea of the higher tract ever having been traversed by the Sutlej. The Haqra River is referred to in the *Annals of Bikaner:*

> Tradition asserts that these regions were not always arid or desolate and that their deterioration dates from the drying up of the Haqra River, which came from the Punjab and flowing through the heart of the country, emptied itself into the Indus between Rori, Bhakkar and Uch.

Minchin continues that the Sirhind tract between the Sutlej and the Jumna is the watershed of the Indus and Gangetic valleys, and the Haqra depression is still the outlet of all the drainage channels of the western Sirhind tract, the main channel being the Ghaggar River.

It is not improbable that at some distant period the Jumna on leaving the hills, turned westward and emptied itself into the Indus. The Western Jumna Canal was excavated during the reign of Firoz Tughlak about A.D. 1360–70 and, as all these old native canals were dug in depressions left by changes in the course of rivers, the probability is that this canal was dug in the dry bed of the Jumna or at least in a portion of it. Locally, the Hansi branch of this canal is stated to have been dug in the bed of the Chitrang.

It seems probable that there has been a gradual upheaval of the Sirhind and Hariana tracts, which may have diverted the Jumna into the Gangetic Valley, and gradually lessened the flow of water in all the Sirhind drainage channels. These channels are now dry except after heavy rains in the sub-Himalayan tracts, and the Ghaggar stream now only occasionally reaches the Bikanir border, whereas formerly there was a perennial stream in most of these channels. Along the banks of the Ghaggar and Haqra are the remains of old cities, now only ruined mounds. In the Sirsa District some of these mounds have been excavated and found to contain marble and stone carvings of great excellence. It is nearly certain that the stone pillars (*lats*) put up by Firoz Shah at Hissar and Fatahabad were exhumed by him from the buried cities and the ruins of his palace at Hissar show that he largely availed himself of these old stone carvings to adorn his underground passages and apartments. Similar ancient towns and forts, such as Marot, Phulra, Mirgarh, Wallar, Dingarh, Mojgarh and Derawar, are found on the banks of the Haqra.

The problem was attacked again in 1886 by R. D. Oldham, a Deputy Superintendent of the Geological Survey in India. In his opinion, the Haqra is the old bed of the Sutlej, although it may have been also fed from a branch of the Jumna, and that it was lost when the former river turned westward to join the Beas. This opinion is based mainly on hydrographical data and Oldham points out that the Haqra depression is being constantly filled up with an alluvium similar to the existing soil, which explains the absence of sandy silt in its bed, and that the high level of the plain over which it pursues its course is a common characteristic of all the rivers of the Indo-Gangetic plain.

Subsequently, Major H. G. Raverty discussed the historical aspect of the question, and his conclusions are that during the thirteenth century:

> . . . the Beas flowed in its old bed past Debalpur (Dipalpur) and the Bihat (Jhelum), the Chenab and the Ravi, having united into one stream to the northeast of Multan, flowed near it on the east side, and united with the Beas some 28 miles to the southward of that city and east of Uch, instead of west of it, as the united waters of the Punjab now flow. Thus, Uch and Multan both lay in the west bank of the Panjnad and were closely united, politically, in consequence.

Further reference may be made to the article written in 1872 on the physical geography of Bahawalpur by J. W. Barns, Superintendent of Irrigation, who considered that the "Bangar" (uplands of the Cholistan) had at a former period been flooded not intermittently, as land is by the Punjab rivers, but steadily. He also found testaceous Mollusca in the Bangar which, in his opinion, had had at one time a settled agricultural population.

In addition to the Haqra, there is another but smaller depression running from 3–12 miles from the Ghara and Chenab rivers and parallel with them, from the northeast in a southwesterly direction. This depression bears various names.

In 1955, the State of Bahawalpur extended along the left bank of the Sutlej River for about 260 miles, thence along the left bank of the Indus up to the border of the Sukkur District of the Sind.

Bahawalpur adjoins 5 Districts of the Punjab, the Sukkur District of Sind and the States of Jaisalmer and Bikanir and comprises the longest single territory, 320 miles in length with average width of 50 miles running from northwest to northeast. It lies between 27° 42′ and 30° 25′ North and 69° 31′ and 74° 1′ East.

With regard to physical features, Bahawalpur consists of a flat, alluvial plain merging in the desert as the land recedes from the rivers where water cannot be brought. It is devoid of all hills and streams except the pools and backwaters of three great rivers of the Punjab: the Indus, the Panjnad and the Sutlej, the latter irrigating northern Bahawalpur.

CLIMATE

It proved impossible to obtain a continuous record of climatic data. For this reason, the following notes have been given.

Rainfall is rare. Showers occur in certain areas during July–August. Clouds often gather on the horizon, but they are usually dispersed by the wind, and there is a well-known proverb which says that "when rain comes to Bahawalpur, it changes into storms of wind."

Table 112 shows that the average rainfall in Bahawalpur Town from 1888–1902 was 5.4 inches.

TABLE 112. RAINFALL IN BAHAWALPUR TOWN, 1888–1902

Year	*Tenths*	*Year*	*Tenths*	*Year*	*Tenths*
1888	40	1893	37	1898	58
1889	58	1894	40	1899	11
1890	18	1895	61	1900	19
1891	44	1896	22	1901	41
1892	130	1897	161	1902	22½

In general, May–August are the hottest months and during this period, the lack of air is often felt, but as a rule a southerly wind blows regularly from 11 P.M. to 9 or 10 A.M. to give relief from the intense heat.

Barns (1872) wrote that Bahawalpur has a very high summer temperature and that few countries of similar latitude have such a continuance of hot weather. The severest part of this season is from the end of April until the middle or end of June during which months the mean temperature in the shade is 103° F.; not only is the heat of the sun very great, but the air is dry and the wind almost fiery, and, during these months, the growth of vegetation is scarcely perceptible. But with the bursting of the southwest monsoon comes a change; gradually the intense heat of the two previous months is softened by clouds, the mean temperature falls to about 95° in the shade, and there is a perceptible degree of moisture in the air. The scorched grass and trees respond to the change by putting forth young shoots and with only an inch of rainfall the whole country looks for a time quite green and fresh. After November, a dry wind from the snowy ranges reduces the mean temperature to 60° or 65° with frosty nights.

A high wind usually prevails, often accompanied by storms during which the atmosphere is dim and misty. The tracts adjoining Cholistan are the worst, as there, on rising in the morning, one finds everything covered with a thin layer of dust and a local poet alludes to his unpleasant experience at Khairpur Tamiwala in the verse:

No doubt the sky is an old (man) but at Khairpur
it is sometimes seen playing with dust like children.

From the latter part of September, the days begin to become moderately hot and the nights cold. By the end of February the cold weather is concluded, and March and April begin the spring season.

During 1943–44, only 3.36 inches of rain fell, but during the next two years a total rainfall of 11.37 inches was recorded. The period 1944–45 was one of the wettest during this century.

To summarize, it is exceedingly dry in summer and winter. The cold season lasts from November–February. The heat is intense (max. 120° F.) in May–August. Cholistan is even hotter. The average rainfall varies from about 7 inches in the northeast to 3 inches in the extreme southwest. In ordinary years, cultivation requires irrigation—total area of the State is approximately 20,000 square miles, of which 6,700 square miles form the agricultural zone. In Cholistan, which comprises the remainder of the area, cultivation is impossible and there is found only a sparse, nomadic population of graziers.

The maximum temperatures recorded during 1892–1900 are given in table 113.

Table 113. Maximum Temperatures in Bahawalpur Town, 1892–1900

Years	*Maximum*	*Years*	*Maximum*
1892–93	124°	1896–97	110°
1893–94	112°	1897–98	123°
1894–95	112°	1898–99	111°
1895–96	116°	1899–1900	111°

Agriculture

Three distinct zones of cultivation run parallel to one another the entire length of the State: (*a*) the Cholistan or Rohi; (*b*) the intermediate tract called the Nahri Cholistani; and (*c*) the riverain (*daryai*).

The *kharif* crops in the Cholistan depend entirely on the small rainfall of July and August. They are generally sown when the rain has permeated the soil to a depth of 24 or more fingerbreadths (*ungals*), but this amount of moisture is hardly sufficient to mature them, and at least two more showers at intervals of a month or so are needed after the seedlings have sprung up, although sometimes one heavy shower will suffice.

The Cholistan lands are regarded as cool (*thandi* or *sard*), and have a great capacity for retaining moisture. Excepting the *dahrs* of Bahawalpur and Ahmadpur, which are unmixed loam, they generally have a layer of sand scattered over them by windstorms from the Great Indian Desert, which, while facilitating the percolation of rainwater to the loam below, also prevents evaporation of the moisture beneath it, so much so that a heavy *aurda-minh* (late rain in September–October) is enough to ripen the small *rabi* area in the Cholistan.

In Minchinabad and Khairpur, however, the Cholistan has more *ratula* than *khira dahr*, and this soil is extremely retentive of moisture. The *tibba ratulas* are damper than the level soils and therefore produce more luxuriant crops. Between the Cholistan and the riverain tracts, the *kharif* crops depend mainly on inundation canals aided by rain, or, where the lands are *autar* (above the level of canal irrigation), the cultivation is dependent on wells (*kurah wahi*). In the intermediate tract (*nahri*) there is an ample supply of water from the inundation canals for the *kharif*. *Rabi* irrigation commences on the twentieth of Sawan and lasts until the canals cease to flow, generally until the end of October.

The lands of this intermediate zone (*hithar*) are also regarded as *thandi;* and irrigation (*rej* or *rauni*) effected in September–October will suffice to ripen the *rabi* crops. Old deserted beds of the river or depressions (generally called *nashebs*, *haryaris*, *budhis*, *laraps*, *lalas*, *dums*, *salunans*, *nawans*, etc.) are filled with canal water, which is raised by Persian water wheels (Pers. *naur* or norias; loc. *jhalars*) to high-lying lands and also spreads by capillary attraction (*ugajj*) into the adjoining parched soil.

The *ugajj* is greatly accelerated by a shower of rain during Bhadon or Assun when the moisture from below, added to the rain from above, gives the land a good moistening. Lands on the canal banks benefit by *ugajj* and are regarded as excellent for cultivation. The extreme *hithar* (*dhur hithar*) or riverain villages, are entirely dependent on floods (*chhal*, *dhak-phissi* or *tughyani*).

In 1900, there were 5,208,897 acres in Cholistan. At the middle of the century there were 2,550,000 acres under cultivation in Bahawalpur.

The principal sources of irrigation were: river floods (*sailab*); canals; wells; and water lifts (*jhalars*). During 1953–54, 2,544,275 acres were irrigated.

During the past few years, the Agriculture Department has been engaged in research work on oil seeds, sugar cane, ginger, Virginia tobacco, cereals, cotton, etc. It has evolved a new variety of American cotton which gives 15 per cent more yield, and needs two less waterings, has a longer staple length, and fetches a higher price than existing 4-F. Ground nut cultivation has proved successful. During 1953–54, 400 percolation wells and 100 tube wells were bored. In Cholistan, the majority of the wells yield bitter water. Here the water table lies at 80 feet. However, percolating through the sand, the well water takes up a very appreciable quantity of sulphate of soda, and is likewise in places impregnated with sulphuretted hydrogen. The daily use of water containing these ingredients is supposed to induce a tendency to scurvy which, among the natives, is counteracted in some degree by their partaking of large amounts of sour buttermilk.

TABLE 114. AGRICULTURAL PRODUCTS IN CHOLISTAN

a) *Rabi:* wheat, grain, *mattar*, *masur*, poppy (*usun*), barley, *sarsun*, *dhania*, *ajwain*.
b) *Khauf: jawar*, *bajra*, cotton, indigo, rice, *sesum*, *mung*, *moth*, *kangani*, *makki*, *mash*, chillies, sugar cane, *sawank* and *bung*.
c) *China: rawan* and tobacco.
d) Garden produce: dates, mangoes, oranges, apples *(suf)* and common vegetables.
e) Trees: *lai*, *barash*, *jund*, *phog*, *kaim*, date, *shisham*, *kikar*, *beir*, *jal*, *bahan* and *sarinh*.
f) Grasses: *tala*, *daribh*, *dila*, *sanwori*, *patrala*, *gagra*, *maina*, *sinji* and *battu*.

In Cholistan the following plants flourish: *gandil*, *dhaman*, *munjar*, *san*, *katran* (odoriferous) and *bakhra*.

Flora

As a result of the fertility brought by the waters of the Sutlej and carried by the main stream and its many canals, large trees crown the banks for many miles, even in the wilderness region of Cholistan.

In addition to the indigenous trees, many exotic species flourish. The million date palms (*Phoenix dactylifera*) furnish food and numerous products. Useful plants and medicinal herbs are well known to the peoples of Bahawalpur, especially in Cholistan.

TABLE 115. INDIGENOUS TREES IN BAHAWALPUR

Native Name	*Latin Name*
Karinh	*Capparis aphylla*
Red Lai	*Tamarix gallica*
Barnan	*Crataeva religiosa*
Kalar-Lai	*Tamarix* sp.
Okdah	*Tamarix dioica*
Bakain or Dharek	*Melia azadirachta*
Nim	*Melia indica*
Ber	*Zizyphus jujuba*
Malha-Ber	*Zizyphus oxyphylla*
Sohanjna	*Moringa pterygosperma*
Shisham or Tahli	*Dalbergia sissoo*
Jand	*Prosopis spicigera*
Sharinh	*Albizzia lebbek*
Kikkar	*Acacia arabica*
Jal	*Salvadora oleoides*
Lasurd	*Cordia myxa*
Gondi	*Cordia rothii*
Bohar (banyan tree)	*Ficus benghalensis*
Pipal	*Ficus religiosa*
Jhit	*Salvadora persica*
Obhanan or Bahn	*Populus euphratica*
Harnoli	*Ricinus communis*
Jaman (Jammun)	*Eugenia jambolana*

Most of the trees found in the orchards of the Punjab grow in Bahawalpur and bear fruit. The almond also grows, but does not fruit.

In those parts of the forests not flooded year by year, the soil is largely impregnated with *kalar*, the saline efflorescence formed on the surface by evaporation of the subsoil moisture, which is drawn to the surface by capillary action. In such soil nothing grows but the *kalar-lai* (hence its name), the *jhit* and a few *jal* shrubs.

In addition to these indigenous trees, the following exotic trees grow well in gardens: *simal* (*Bombax malabaricum*); *dhaman* (*Grewia oppositifolia*); *beli* (*Limonia acidissima*); *bel* (*Aegle marmelos*); *ambara* (*Spondias mangifera*); *dhak* (*Butea frondosa*); *kachnar* (*Bauhinia variegata*); *imli* (*Tamarindus indica*); *amaltas* (*Cassia fistula*); *sufedsharin* (*Albizzia elata*); *bahera* (*Terminalia bellerica*); *arjan* (*Terminalia arjuna*); several kinds of *Eucalyptus; kumar* (*Gmelina arborea*); *gular* (*Ficus glomorata*); *papri* (*Ulmus integrifolia*); *anola* (*Phyllanthus emblica*); *charbi* (*Excœcaria sebifera*); and *bans* (*Dendrocalamus strictus*).

The *babuli*, called *bavali* (*Acacia eburnea*), a small, thorny shrub, grows abundantly in

Cholistan. It makes good fodder for goats and camels and is also used for fuel and fences. Its thorns and leaves are like those of the *babul* and so it is called *babuli* or "dwarf *babul*."

At the beginning of this century, there were 773,138 date trees grouped as follows: male trees, 581; *khassi*, 406,832; female trees, 331,506; and others, 34,219. Of this total, only 41,301 were Bahawalpur State property.

The female flowers are sometimes fertilized artificially by the Khajurwalas. This is done before the flower sheaths open. A hole is made in the sheath of the female flower and a few pieces of the male panicle are inserted. The female trees are of two kinds: (*a*) yields fruits containing a stone; and (*b*) called *khassi* fruit, which has no stone. However, the popular division of the date trees is: male, female and neuter.

The date fruit has different names at various stages of its growth; thus, in Baisákh the date is called *makaurd*, in Jeth *gindaura*, in Har *doka*, in Sawan *pind*.

The date is used in many ways:

a) *Wandi-pind*, ripe dates eaten fresh.
b) *Luni-pind* (from *lun* = salt), raw dates preserved in salt and eaten in winter.
c) *Chirwin-pind* (*chirna* = to cut) when the stone is separated from the fruit and the kernel dried.
d) *Sokwin-pind* (*sokana* = dry) for certain kinds of dates dried without extracting the stones and used in winter. These dates do not spoil. *Sokwin-pind* can sometimes be kept for a full year.

Each part of the date tree has a separate name. Thus, the growing stem is termed *mundh*, but when cut off and stripped of its branches it is called *chhanda*. When a number of date trees sprout from the same root they are called *thadda*. The branches, which have many uses, are called *chhari* and the leaves *bhutra*. From the leaves, mats, baskets and fans are made. The fans made at Uch are the finest. The leaves are cut into thin fibers, which are dyed with green, red, yellow, etc. The various forms into which the fibers are woven are called *chaukarian*.

The *jhit* (*Salvadora persica*), *obhanan* or *bahn* (*Populus euphratica*) and the *kachnal* (*Bauhinia variegata*) serve many purposes. The twigs of *S. persica* are used by Moslems as toothbrushes (*miswaks*) and those of *B. variegata*, called *datan*, by Hindus.

In summer sweet juice trickles from the branches of the *jandi* (*jand*, *kanda* or *kandi*) tree (*Prosopis spicigera*), and around it a white insect with 6 legs, called *baggi-lindui*, is always to be found. They cling to the place whence the juice exudes in two or three parallel strings and invariably keep in line. This juice, trickling from the branches, blackens the ground. The Zamindars collect this dark earth, mix it with water and strain it. The juice thus obtained is boiled and made into syrup which resembles honey. This syrup, called *mahla*, was sold as honey by the Hindus of the Lamma.

The following plants grow wild:

a) *Ak* (*Calotropis procera*).
b) *Lana*, which has 3 species: the *lana*, *lani* and *gora-lana*; camels are fond of the last two.
c) The wood of the *phog* (*Calligonum polygonoides*) is used as fuel, generally for burning bricks in native kilns; the leaves are grazed by camels and goats.
d) *Khar* (*Caroxylon griffithii*) grows in abundance in Cholistan; it begins to shoot spontaneously in March, grows to the height of 2–2½ feet and is cut in August. *Sajji* or *ashkhar* (*barilla* or impure sodium carbonate), obtained by burning the *khar* plants, is used in preparing several medicines and more especially in making soap. In Cholistan there are fields of *khar*, called *dahes*, which are leased annually. These leases are put up to auction, and the State derives a handsome income from this source. Sometimes poor people, instead of *khar*, use *lani* which they burn, washing their clothes with the ashes. Others wash their clothes with a powder made from *gora-lana* mixed with water, and townspeople use *gora-lana* for washing silk, especially yellow silk, and golden ornaments.
e) *Kana* (*Saccharum sara*), a kind of reed, is either red (*lal*) or white (*chitta*). The upper part (*tilnu* or *tili*) is used for making *pakhis* (*tilnu sholdari*), winnowing baskets and *jharus*. The sheaths, which cover the *tilnu*, and the two or three upper nodes (*munj*) are used for making good ropes and fine *van* for weaving onto *charpais*. The lower portion (*kana*) is used for thatch, *patals*, and fencing. The leaves (*sar*), when green, make good fodder for cows and buffaloes; when ripe and dry they are also used for thatch. It is also distinguished as true (*sachcha*) or false (*jhuta*); the leaf of the former is not so broad or coarse as that of the latter. The Zamindars believe that if a well be sunk where *sachcha kana* has been growing, its water will be sweet.
f) The *kanh* or *kahi* (*Saccharum spontaneum*) is a

reed growing on the river banks; in the tract west of Muhammadpur Lamma, it is also found on the canal banks. *Kanh* makes good fodder for cattle and buffaloes. This reed, often of superior quality, is used for pens.

The following is a list of various other plants with references to Stewart's "Punjab Plants," where traceable:

1) *Akri* or *panirwala ak* (*Withania coagulans*) is said to flower throughout the year; its seeds are given to children for colic.
2) *Alsi* (*Linum usitatissimum*) grows spontaneously in gram and *methra* fields; oil is extracted from the seeds.
3) *Amarwal* or *iftimun* (*Cuscuta reflexa*) is used as a medicine; it is found on trees, especially on *ber* which it kills.
4) *Angari* is a reddish plant, some 6 inches high, which grows on inundated land. If eaten by animals, their milk becomes red like blood. It grows in Asauj and Katak.
5) *Baphalli* (*Corchorus capsalaris*) is a cooling medicine useful in cases of gonorrhea; it is also eaten by animals.
6) *Bakhra* (*Tribulus alatus*), whose seeds are used for food, especially in times of scarcity; they are also eaten by women to ensure fecundity.
7) *Bathun* (*Chenopodium album*) is used as a pot herb.
8) *Battu* (*Amaranthus gangeticus*) grows in wheat fields; it is given both to men and horses to cure catarrh and headache.
9) *Bhangra* (*Eclipta erecta*), a parasite of two kinds: one bears blue flowers and from it women prepare collyrium (*kajjal*); the other is used to cure the necks of oxen when galled by the yoke; it is burned and the ashes applied to the wounds.
10) *Bhokat* (*bhugat* in the Punjab) is a well-known vegetable.
11) *Bhuin-phor* (*Phelypaea calotropidis*) is applied to horses' sores.
12) *Brahm-dandi* is reported to cure gonorrhea.
13) *Bukkan* (*Lippia nodiflora*) makes a good fodder for camels and is used as a medicine.
14) *Chhitun* grows under *karinh* trees during the rainy season and yields pods resembling those of the *sohanjnan* tree, which are eaten before they ripen by the inhabitants of Cholistan and some poorer classes elsewhere.
15) *Chirihaththa* is a grass which grows on fertile land; when used as an infusion, it has a cooling effect.
16) *Dhatura* (*Datura stramonium*) is used as medicine as well as a poison, and its leaves are applied to ulcers and boils.
17) *Dhaman* (*Fagonia cretica*) has medicinal virtues and is given as a tonic.
18) *Farid-muli* is prescribed as a cooling medicine.
19) *Gidar-war* remains green throughout the year except in Poh, growing to a height of 3 feet, and its leaf resembles that of the *shisham* (*Dalbergia sissoo*); it is used as a cure for a first attack of kidney disease.
20) *Gorakhpan* is a cooling medicine.
21) *Hathi-sundi* bears a fruit like the trunk (*sund*) of an elephant (*hathi*).
22) *Hazar-dani* (*Euphorbia thymifolia*) grows in Cholistan during the rainy season and is said to cure chronic fever.
23) *Jawansah* or *jawanh* (*Alhagi maurorum*) is a well-known plant, used in making *tattis* in the hot weather. Camels delight in it as fodder.
24) *It-sit* (*Trianthema crystallina*), eaten by cattle, is also used as a medicine.
25) *Kanderi* (*Gymnosporia spinosa*) is given to horses to cure colds.
26) The fruit of the *karwilun* (*Capparis horrida*) is made into pickles (sing. *achar*).
27) *Khitittar* or *khatittan* (*Rumex hastatus*), also called the *khorasani-palak*, is used as food.
28) *Khiral* grows in Phagan and Chet; its leaf is a little smaller than that of gram, and produces a milky juice when squeezed. It is used in preparing calx of tin and as a cure for gonorrhea.
29) *Khunb* or *khunbi* (*Morchella spinosa*) is commonly dried as a vegetable.
30) *Kinkinra* resembles the *rehan* (*Ocimum pilosum*) or sweet basil. It grows to a height of about 6 inches and is believed to cure gonorrhea-simplex, strangury and stone in the bladder, and its seed has also medicinal properties. Inundations destroy this herb.
31) *Mako* is very bitter but possesses medicinal properties; its fruit, being sweet, is edible.
32) *Mareri* grows in summer when it is eaten as a vegetable.
33) *Mund buti* (*Sphaeranthus hirtus*) is used as a medicine. Its flowers are officinal and are used as an alterative, depurative and as a cooling and tonic medicine which is highly esteemed.
34) *Nak-chhankni* (*Myriogyne minuta*) produces a kind of snuff.
35) *Pad-bahera* is a mushroom.
36) *Phatokan* is a creeping plant with a leaf about the size of a fingernail; it is given to horses as a cure for worms. Human beings also take it.
37) *Resham buti* (*Berthelotia lanceolata*) is a medicine used like senna.
38) *Rain buti* grows in Cholistan in Chetar and Baisakh after rain; it is supposed to cure boils and piles.
39) *Suk-mard* is a kind of grass like *mareri;* it is said that people who have boils and pimples are

benefited by it, provided that they and their descendants for 7 generations use it and nothing else for their ailments, but if they use any other medicine they and their children for 7 generations will derive no benefit from the plant and will continue to suffer from pimples.

40) *Tikan* is used as a medicine.

41) *Trai-patri* (*Marsilea quadrifolia*) is an herb which grows near wells and is used as a cure for liver diseases.

42) *Tummun* or *kortumman* (*Cucumis colocynthis*) is given to horses as a digestive and is also used as a purgative.

The following grasses are used as fodder:

1) *Sawri* is usually grown on river banks and in rice fields. Horses and cattle eat it readily.

2) *Darabh* or *dabh* (*Cynodon dactylon*) is commonly found in the firmer soils and in hard clay, but it is not uncommon even in sandy soils. It supplies a good fodder for cattle and is sometimes used for roofing.

3) *Lila* (*Cyperus* Sp.) yields a good fodder for buffaloes.

4) *Kuriya* is sown by cultivators and grows both in winter and summer.

5) *Sanwak* (*Panicum colonum*) is either sown (*ijwin*) or wild (*saya*).

6) *Bhattal* is eaten by sheep and goats; from its juice an eye medicine is prepared.

7) *Mainan* is eaten by buffaloes and cows.

8) *Wigara* grows in wheat; its tendrils resemble those of the pea.

9) *Patrala* resembles the *wigara*, but its leaves are broader; it grows on land that will not produce wheat.

10) *Lia* is a thorny vegetable which is fatal to crops; it grows to a height of 2½–4 feet. During Poh, when it is very small, farmers cut and dry it for fodder and if given to milch cows, they yield a larger quantity of milk. After Poh its thorns, which resemble those of the *thohar*, become bigger and cattle cannot eat it. If *lia* grows for 2 or 3 successive years in a field, it becomes utterly useless for cultivation. *Lia* grows with the wheat and usually disappears with it.

11) *Talla* is an excellent fodder for cattle and horses. There is a local saying, "*Talla* is good for horses and *khalla* [shoe beating] for women."

12) *Tarar* or *makhnala* grows during the rainy season. Horses are very fond of it.

13) *Wisah* grows in Sawan and Bhadon; its round leaf tastes like a clove; all animals, except horses and asses, eat it—particularly camels. If a man is bitten by a snake, he is made to drink a decoction of *wisah* as a purgative; it is also applied as a poultice for boils.

14) *Jandal* is a spontaneous grass which grows in wheat and barley fields.

15) *Dodhak* is eaten by sheep and goats.

16) *Khawi* (*Andropogon laniger*) is an odorous grass, which smells like lemon, and forms a most nutritious fodder.

17) *Jau-sag* is fed to animals. It is also eaten mixed with a kind of vegetable (*gandlan*). It is also used as a vegetable when dried.

18) *Palwahan* (*Andropogon pertusus*) is a very good fodder for horses and cattle.

19) *Gurm* (*Panicum antidotale*) grows on the banks of rivers; it also is a good fodder for cattle.

20) *Khub* grows in the rainy season; its root resembles an onion and its flowers are red and white. Cows, buffaloes and camels eat it freely.

21) *Lumbar* is a small grass resembling a fox's brush.

22) *Kulanj* is the food of cattle, more particularly of cows.

23) The leaf of the *tandula* resembles that of the plum tree (*beri*); it grows in the rainy season. Animals eat it. Women cook it for food. It is also used as a cure for neuralgia.

24) *Nilofar* (*Nymphæa lotus*) is abundant in *dhands* and depressions full of water; its leaves and flowers always lie on the surface and it remains green from Baisákh to the end of Sawan. The flowers are used in native medicines such as *sharbat* and *araq*. The seeds, called *nafa*, are generally used by Hindus on the *ikadashi* fast days. *Lor* obtained from the root is used either cooked as a vegetable or eaten raw.

24a) *Kanwal* lotus (*Nymphæa lotus*) is just like the *nilofar* and abounds in *dhands*. It is also called *paban*. Its large circular leaves always float on the top of the water, and the root (*bhe*, apparently a corruption of the Persian word *buk* = root) is used as a vegetable both green and dried. The *bhe*, cut into pieces about half an inch long, is dried and is then called *kochri*. Both *bhe* and *kochri* are extensively used by Hindus on the *ikadashi* fast days. Its fruit, covered in *tiki*, is called *kaul doda*, and is used both green and ripe. When green, it is eaten raw as well as cooked. When ripe it turns black and its rather hard rind is used as a medicine.

25) *Kundar* or *dukh* (*Typha angustifolia*), or bulrush, is usually found in the *dhands* in the Lamma. Mats for mosques are usually made from *kundar*. *Charpais* also are woven from it. Its ears resemble those of the *bajra*, but contain no grain, only a yellow down of which a kind of sweetmeat (*buri*) is made, and which is considered to have astringent and aphrodisiac properties. Below the ear a glutinous substance (*khoh*), which is very inflammable, is found.

FAUNA

There is a relatively wide range of fauna. As would be expected from the physical features of the country and the climate, wild animals are few in number.

Mammals. The wolf (*nahr*) still lives in Cholistan. Wild pig (*mirhun* or *jatama*, boar; *bhundni*, sow) were found in large numbers in the jungles and State reserves. The hog-deer (*pahra*), ravine deer (*hiran*), black-buck (*kala hiran*), *nila* or *nilgai* and *rojh* are also common and the wild ass (*gorkhar*) is seen occasionally in Cholistan. Other animals include the fox (*lumbar*), jackal (*giddar*), hare (*sayyar*), hyena (*targh*), wildcat (*jangli-billa*), porcupine (*seh*), mongoose (*neol*), badger (*bijju*), squirrel (*gahlar*) and muskrat (*chhachhundar*). Wild rats (*chuha*) of a brownish color may also be seen in certain localities of Cholistan.

Birds. The common birds are white and black partridges, quail, ducks, chukhors, pigeons, kites, hawks, vultures, herons and parrots.

The lark (*chandul*) is supposed to soar at dawn into the sky in a state of ecstasy, singing hymns to God, and then fall senseless to the ground. If a dog or jackal then finds and devours the bird, it is supposed to cause the animal to go mad as punishment for eating a bird so devout. Owls are of three kinds: *chibri*, *huk* and *gagh;* the latter is also called *karakka shinh* or the "Kirar's tiger," because the Hindus have peculiar beliefs about its being ill-omened. Hawks are of various species: *baz* (fem. *jurra*); *bashin* (fem. *basha*), a falcon; *chipak* (fem. *shikird*), also a kind of falcon; *lagar, shahin,* and *tamtari*, all hawks. The *kurar* or *kurl* is a species of eaglet, which is supposed to lure fish to the surface by its cry of "kurar, karar," and then swoop down on them.

Reptiles. The hooded cobra (*phanyar*) is said to be of 10 different colors: *bishyar, mushki, kala-mushki, chuhra, chuhra-mushki, kakora* (brown), *tilyar* (pale gray with large black spots), *moti-bind*, *gul-kala* and *chitta* (white). The female cobra is called *padam* and is either *kali* or *muhranwali* (having large spots of the size of a *mohar*) whose bite is very deadly, so that it is said that "he whom a *padam* has bitten will not be able to go another step."

The *khapra, karundia* or *jidebi* (i.e., folded like a *jalebi*), the *tirmar,* the *phulan* (a small, thin snake), the *jharohi* (*dhobi* of the Punjab), the *sangchur*, the *ghora* and the *sambal* are also found. The *wains* is said to curl itself round a buffalo's leg and thus suck the milk. The *ghore-dang* is so swift that it is believed it can bite a galloping horse. The *damuhen* ("two-headed") with head and tail of equal thickness, is usually found near wells. The *jatali* ("hairy") snake is said to have hair on its body. The *kulsar* is credited with the power to convey its poison to its assailant through his stick, which invariably breaks. The *kingnan* is a very venomous snake. The *sah-pivna* is the subject of curious beliefs. It is believed that it will not bite during the daytime even if held in the hand, but at night it crawls in a sleeper's breast and poisons his breath, striking him with its tail before it makes off. It is even said to remove all sticks, etc., from the sleeper's side with its tail, so that on awaking he may find no weapon to hand. People in Cholistan usually sleep with a lamp burning in the house, since the *sah-pivna* is afraid of a light. The *thanadars* of Islamgarh post a guard to keep off the *sah-pivna* at night. Another snake is the *chitkannan.*

From 1890–97, Rs. 244–358 were paid annually for killing snakes, the number killed ranging from 1,751–2,480; in November, 1897, rewards ceased to be paid.

Amphibians. Frogs (*daddu;* m. *didar;* fem. *did*) are common in swampy areas. The tortoise (*kachh-karumman*) is very common in the rivers and *dhands* and even in wells. It is eaten by the Chuthras and the Kehal and Mor tribes. Alligators (*sansar*) are rarely seen.

Lizards are numerous and of various species, including the *goh, kirri* or *kirra* (a large lizard), *kirla*, *gohira* and *sanha;* the three latter are believed to be poisonous. The *khamn* is said not to copulate, but to be born of a snake. The *gilai* will, if shown to a woman before she begins to churn, cause the quantity of butter produced to be increased.

Fishes. The carp, *dambhra* or *rahu* (*Labeo rohita*) of the Punjab is the finest fish found in Bahawalpur and is said to be very nourishing. If a child is sickly, the mother is made to eat *dambhra* to cure its debility. It is credited with the power of jumping from a depth of 18 cubits under water to a height of 18 cubits in the air. The *thaila* (*Catla buchanani*), also a carp, ranks next. The *mori kakkar* (*Cirrhina mrigala*), also of the carp family, has powerful jaws shaped like a weeding knife and can cut through the meshes of any ordinary net so that it must be caught in wire nets. The *jhalli* is good eating, as is the *singhari* (*Macrones cavasius*), which is much used as an ingredient in *pilau;* both are singularly free from bones. The *batti* (*Notopterus kapirai*) has very thin bones, which cannot be extracted; they are pounded with the flesh for cooking. The *ghoghun* (*Callichrous bimaculatus*) and *shurku* are also found; the latter is also called *darya-da-kukkar* or "cock of the river," and it is said that its flesh cures diseases of the kidneys and bladder.

Among other fishes are:

a) *Chhalli.*
b) *Dhunguan.*
c) *Chhuchhi* (12 x 2 inches) which has numerous bones and is not pleasant to the taste.
d) *Sher-vang* ("lion-color") has black, red and blue spots on the scales and is inedible.
e) *Durra* (*Rohtee cotio*) is as large as the palm of the hand and its breadth just exceeds its length.
f) *Drura* or *dar-ra* (*Barbus chrysopterus*).
g) *Dahi* (*Labeo calbasu*), dark in color, is called the "female barber" (*nain*) in the Punjab and the "wife of a waterman" (*machhi* or *machhani*) in the Ubba.
h) *Daula* or *guddu* (*Ophiocephalus punctatus*), called *garai* in the Punjab, is a very powerful fish and is said to be able to force its way up to the roof of a house against the flow of the gutter.
i) *Dabbi*, a small fish.
j) *Dara*, 5 inches long and 1 finger thick, has many bones and is tasteless.
k) *Dungnan* (*Pseudeutropius garua*) is about 12 inches long, has many bones and is good eating, according to Moslems.
l) *Prawns* (sing. *gan-gut*) are never eaten by Moslems.
m) *Eels* (sing. *goj* or *sap-machhi, Mastacemblus armatus*) are generally believed to be the offspring of a fish and a snake. Native doctors cut off the head and tail and prepare from them a medicine to cure impotence.
n) *Gujird* (*Mastacemblus pancalus*) is a species of *goj* or *sap-machhi.*
o) *Guddu, shakir* and *chitra* belong to the so-called "snake-headed" group (*Ophiocephalus*).
p) *Kanghi* or *kunghi* (*Ambassis baculis*), a small silvery fish 24 inches long and 1–3 inches wide, which has so many bones that it is called *kanghi* = comb.
q) *Khandarli* or *kharnin* (? *Barbus sarana*) is good eating.
r) *Khaththa, luankh* or *lakhi* (*Saccobranchus fossilis*), called *singi* in Hindustan, is small, with red and black scales and has 3 sharp spikes on the head.
s) *Makhni, makhlani* or *malli* (*Wallago attu*), called *boali* in the Punjab, is excellent eating and is reported to stop diarrhea. Hindus abstain from eating it. If a Hindu, who has fine eyes or is considered handsome, suffers from the Evil Eye (*nazr*), he sacrifices a *malli* by turning it around his head and giving it to a fakir or throwing it away. The evil effects will be removed.
t) *Mukkar*, with a serpentiform head, measured 3–4½ feet in length and makes an excellent dish.
u) *Palla* (*pallu*) resembles the *malli* (*see* under *s*); this name is often given to the young of the *malli.* It is excellent food.
v) *Pari* or *parri* (*Notopterus chitala*).
w) *Pharanda* or *shahingar* ("tiger fish" or *kingar*), about 5 inches long, has 2 head spines and is good eating.
x) *Shaikh-sharikh* (*Labeo curchius*) is excellent when fried.
y) *Sunni* or *sohnin* (*Cirrhina reba*) is said to subsist only on grass.
z) *Mukkar machhi* or *tirkand* is famous for its 3 large horns.
zz) *Wonchhi*, about 2 inches long, is white and very delicious. This was a delicacy of the Nawabs of Bahawalpur.

Fishing is carried out by the following methods:

a) Set of small nets (*sini-jal*), dragged by 20–25 men, weighted down with iron rings.
b) Six sticks and a string net, shaped like a cage, used in 2–3 feet of water. This is called a *kurhi.*
c) A quadrilateral cotton net with iron rings through which a drawstring passes. The *jala* is used in water 12–14 cubits deep.
d) Made from wooden strips and thread spun from *ak* fibers, this net (*nara-taru*) floats upright in the water for catching surface fish.
e) A deepwater net (*nara-bodu*) similar to *nara-taru.*
f) Iron hooks (*kundi*) only for catching *tirkand, pari* and *malli.*
g) Spear (*chhat*) for use in clear water.

Insects. The locust (*makri*) is dried and eaten by the people in Cholistan. White ants (*siwi*) are a great pest, causing damage to beams and rafters. There are said to be 4 varieties:

a) The root-eater (*jarh-gal*).
b) The trunk-eater (*mundh-gal*).
c) The leaf-eater (*pattar-gal*).
d) The flower-eater (*shagufa-gal*).

Black ants (*makaure*) and common ants (*kawili*) are common. There are 2 kinds of wasps:

a) The regular yellowjacket (*debhun*).
b) A larger species (*kabuli-debhun*), which may be driven from its nest by burning sulphur.

Resembling a wasp, but harmless, is the *gharain*. Bees are plentiful in the towns, villages and desert areas; they usually prefer *jal* trees.

Centipedes and millipedes (*kankoil, hazar-janghi* or *saujanghi*), scorpions (*wathuan*) and spiders (*danwar*) are common as elsewhere. A special insect (*labana*) is fastened around a child's neck to cure infantile convulsions (*umm as-sibiyan*).

The *kutti*, found on trees and in grain fields, does considerable damage and causes itching if touched.

A tick (*chichar* or *chamchichchar*) is common. Another arthropod, called *jawa*, is poisonous; this is common in Cholistan and its bite is difficult to cure; occasionally it is fatal. Another insect, called *chor but ghamar* in the Punjab, makes pitfalls in the sand and entraps ants in them. This insect is tied in a piece of red cloth around the neck of a child suffering from *chor* fever.

Domestic Animals. The principal domestic animals are cows, buffaloes, sheep, goats, horses, donkeys and bullocks. The figures given in 1900 were 60,213 bullocks, 201,726 cows, 1,789 buffaloes, 52,838 female buffaloes, 6,268 camels and 4,403 horses and ponies. There were 100 bullock carts. Domestic birds include chickens, pigeons, parrots, nightingales, *maina* and *khumra*.

Mr. R. E. G. Cunningham[1] calculated that the number of livestock in Bahawalpur during 1955 included: horses, 123,700; cattle, 295,500; camels, 43,600; goats, 316,400; mules and donkeys, 31,500; buffaloes,[2] 252,600; and sheep, 1,260,000. He wrote: [3]

> These figures can be looked on as reasonably correct. I took some trouble to ascertain them through various methods. For instance, it is known that the wool production per annum in Bahawalpur State is 45,000 maunds, approximately. Estimating that each sheep cuts three pounds of wool annually, it is easy to estimate the number of sheep. I have arrived at the figures for the other stock in a similar manner.

According to Dr. S. Zahiruddin, there are two main types of sheep: (*a*) those fed on the desert pastures; and (*b*) those fed on crops grown in the irrigated areas in addition to the grazing available.

The former is the short-eared or Buchi type which is mostly found in the Cholistan tract. The latter is the long-eared or Lohi type and is seen mainly in cultivated tracts and riverain areas. There is a theory that the sheep grazed on desert areas produce finer fleece and those in irrigated areas are coarser. The Buchi sheep have an excellent type of wool.

Mutton forms the basic meat supply for the 2,000,000 inhabitants. The meat produced is very tender and tasty. A very lucrative industry that has not so far become popular is the preparation of cheese. The leather, tallow and gut industries are increasing rapidly.

Bahawalpur produces a very superior type of carpet wool which brings premium prices compared to wool produced in other parts of Pakistan. At present, on the average, 3–4 pounds of wool are obtained per head per clip. It is reported that some fleeces weighed 17 pounds.

Shearing gangs tour the country visiting outlying parts; they pay the grower a lump sum for the fleece of each sheep. Most of the wool is carried to a wool market at Bahawalnagar; a small proportion reaches markets in Ahmadpur East, Bahawalpur and Khanpur. The practice of selling to shearing gangs tends to encourage middlemen all of whom make huge profits which should, if properly organized, go to the grower.

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[1] United Nations Office, Karachi. Permission was granted by FAO, Rome, to quote these statistics from "UN Survey of Bahawalpur State on problems affecting the Range."

[2] The finest breed is the Nili.

[3] In a letter from Karachi dated July 7, 1955.

At the wool market, the wool is washed and dried. The middlemen have their own indigenous system of judging and classing wool; they sort it out into different class piles. It is then bagged and shipped to various exporters in the country.

The principal Cottage Industry is the manufacture of woolen blankets (*falasies*), *kuppas* and *kuppis*, old-fashioned type goblets, leather and goat-hair ropes and chest straps used for camel harness and minor sundry articles.

HISTORY [4]

The earliest evidence pertains to the period 515–509 B.C. when the Persians dominated this area. Darius Hystapses sent Skylax of Karyanda to explore the course of the Indus.

Greek [5] historians and the later Muhammadan [6] chronicles record that the Persians held the Indus Valley. When Alexander had won a victory over the Malloi at the battle of Multan, the Oxydrakae [7] surrendered and sent him 1,000 men as hostages and 500 war chariots. Leaving Philippos in charge, Alexander sailed down the Indus to found another Alexandria.

The Buddhist Empire of Asoka included Sind and part of Bahawalpur. During the Kushan Dynasty, a Buddhist monastery was erected at Sui Vihar in the reign of Kanishka, as revealed by the Bactrian-Pali inscription.

From the close of the Kanishka period to A.D. 495, little is known. However, the *Tarikh-i-Murad* claims that Fort Mau was built by Sahans Kahor, believed to be a contemporary of Christ.

Rajah Diwaij began to reign in A.D. 495. He was one of the Rai Dynasty, whose dominions ranged from Kashmir and Kanauj to Kandahar and Seistan, on the west to Makran in Baluchistan and on the south to Surat. With their capital at Alor, their rule included the greater part of Bahawalpur.

Five rulers of the Rai Dynasty governed for the next 137 years: Diwaij, Siharas I, Sahasi I, Siharas II and Sahasi II. However, the last ruler allowed Chach,[8] a Brahman, to obtain great influence. Upon the death of Rai Sahasi II, Chach married his widow, established himself on the throne, and began a series of conquests. His rule extended to Kashmir, Kandahar and Las Bela. After reigning 33 years, Chach died and was succeeded by his brother, Chandar, who ruled for 8 years until his nephew Dahir succeeded him. Serious disputes ensued between Dahir and his younger brothers, Rai and Dharsiya.

Then came the several Arab invasions. Finally, an army under Muhammad ibn Qasim, who was joined in Makran by Muhammad Harun, killed Rai Dahir at Rawar between Brahmanabad and Nirun in June, A.D. 712, and took Alor, Uch and Multan immediately afterward.

Three years later, Muhammad ibn Qasim was recalled and put to death by the Khalifah Sulaiman. In A.D. 718, Amru ibn Muslim al-Bahali was placed in command. He induced many Hindu chiefs to embrace Islam. Jai Sinh ibn Dahir was among these converts. As a result, he regained his possessions until slain by Junaid, who marched to the Indus. This was the end of the Rai Dynasty.

Then followed a contest between the Abbassides and the Ummayids. Hashan was succeeded in A.D. 759 by Umar ibn Hafs, called the Hazarmard. In A.D. 836, Ali occupied Kaikan, the country of the Jats, and subdued the Meds, building a causeway known as Sakr-ul-Med, now Sukkur (Sakkar).

After the death of Yakub ibn Lais in A.D. 879, Multan and Mansura, two principalities, were founded. Multan, which must have included the greater part of Bahawalpur, was visited in A.D. 915–916 by Al Masudi (Maçoudi), who described a flourishing community under Amir Abu'l-Talhat ul-Munabba Quraish. His revenue came mainly from offerings made at the Temple of the Sun in Multan. A few years later Al Istakhri and Ibn Haukal visited the Indus Valley. They also gave favorable descriptions of Multan and Mansura.

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[4] The best sources are: (*a*) the *Tarikh-i-Murad* by *Sayyid* Murad Shah, Chief Judge of Bahawalpur, 1865–76. This manuscript was based on original materials as well as on (*b*) the *Jawahar-i-Abbassiya* by Sheikh Muhammad Azam, written between 1809–30; (*c*) the *Mirat-i-Daulat-i-Abbassiya* by Daulat Ram, written about 1800; (*d*) *sanads* by former rulers; and (*e*) the *Tarikh Ahmad Shahi* in manuscript. There are also several local religious histories, such as the *Malfuzat* of Sheikh Hakim of Mau Mubarak, those of the Bukhari and Gilani Makhdums of Uch.

[5] See *Journal* of the Asiatic Society of Bengal, 1892, p. 198, Calcutta.

[6] Cf. Gardaizi, author of the *Zain-al-Akhbar*, who wrote in 1052–1053.

[7] Probably the inhabitants of the area around Uch or Sandur.

[8] Known to the Arabs as Sassa (Sasa), son of Silaij. He is said to have invented chess. Most of the Sarsut Brahmans claim to be his descendants.

In A.D. 985, a sect known as the Karmatians was founded by a Persian named Abdulla ibn Maimun. He preached that the line of the true Imams closed with Ismail, seventh in direct succession from Ali, Hassan and Hussain. He denied the doctrine of the Resurrection and taught that good deeds were not rewarded nor evil punished in this world or the next. This Sect derives its title from Karmat, a minute Arabic script used for their secret dispatches. It has been suggested that the Karmatians came as refugees from Bahrain and Al Hasa.

According to the *Tarjuma-i-Maani*, Sultan Mahmud saved Multan from the Karmatian heretics until they regained possession and appointed Hamid Khan Lodhi as governor.

During the Ghaznivide period, Mahmud of Ghazni invaded Multan in A.D. 1005 and obtained a surrender after a seven-day siege. Nineteen years later, Mahmud revisited Multan and there refitted his army before marching southeast to Mojgarh (Maujgarh). Next year he conquered Mansura.

During his return trip to Ghazni, Mahmud passed through Cholistan where his army suffered. According to the *Jami-ul-Hikayat:*

> Two Hindus offered themselves as guides and led the way for three days into a desert where there was neither water nor grass, and then told Mahmud that they had been commissioned by their chief to lead him astray. "You have the sea (*darya-i-azam*) before you and the army of Hindostan behind; do with us what you like for not a single man of your army will escape." A waterfowl was seen flying in the air. The Sultan said, where there are waterfowls there must be sweet water, and proceeded after it. At length he reached the banks of a great river, the water of which was brackish and unfit to drink. He then saw another waterfowl, and followed it up and came to a valley in which they discovered sweet water. There they found a descendant of Ali, who was dwelling there with his family. The Sayad declared his ignorance of the road, but pointed out an old man close by who knew it. The latter led them to a certain spot on the bank of the river, but the army found it unfordable. The Sultan, casting himself upon the protection of Providence, regardless of himself and fearless of the consequences, with the name of God upon his tongue, urged his horse into the stream. The army followed and, with the assistance of God, crossed in safety.

Minchin suggests that since the water was brackish, this must have been a branch of the Haqra.

The Sumra and Samma Dynasties covered the period from A.D. 1020–1506. According to the *Tuhfat ul-Kiram*, the Sumras are descended from the Arabs of Samarra (Samira), who came to the Indus Valley during the second century of the Hegira. Sir Henry Elliott (1867) believed that the Sumras were Pramuras of Rajputana, who, with a kindred tribe called the Umra, gave their name to Umra-Sumra, the country around Alor. Others suggest that they might have been Som Rai, but almost certainly of the Pramura stock.

Abul Fazl wrote that 36 Sumra princes ruled for 500 years but the *Tarikh-i-Tahiri* describes them as Hindus and assigns their rule to a period of 143 years.

An interesting point was raised by Sir Henry Elliott (1867, vol. 1, p. 491) who observed that in the sacred writings of the Druzes, compiled by Maulana Bab-ud-Din, there occurred an epistle addressed in A.D. 1032 to, "the Unitarians of Multan and to Sheikh Ibn Sumar Raja Bal in particular." Elliott (1867) continues:

> It seems quite evident from this curious coincidence of names that the party particularly addressed was a Sumra; that this Sumra was a Karamatian; . . . and that the Karamatians of the valley of the Indus were in relation and correspondence not only with those of Persia and Arabia but also with the Druzes. . . .

From A.D. 1210–1217, the Ghorian Sultans were in control. In the meantime, the Mongol invasions began under Genghis Khan, whose forces attacked Multan in A.D. 1224. The Khalj tribe from Khwarazym (Khorezm) became established in Mansura. The Mongols held sway until A.D. 1437 when the Langah Afghans broke out in rebellion. In A.D. 1443, Sheikh Yusuf of the Quraish was elected ruler of Multan and Uch until expelled two years later by Qutb-ud-Din, who ruled for 16 years.

In A.D. 1469, he was succeeded by his son Hussain Langah, who was a Paramount Chief of the Baluchis. Others received part of Sind, so that the territory between Sitpur and Dhankot was occupied by Baluchis.

In A.D. 1524, the Arghuns invaded Multan but Mahmud Shah died before they reached the capital. Hussain Langah II, young son of Mahmud, was raised to the throne.

In A.D. 1525, Shah Hussain marched on Fort Derawar, sending in advance a force under Sambal Khan to find an area for encampment. The scarcity of water compelled Sambal Khan to sink 300 wells in the Haqra. As a result, Shah Hussain's army was able to lay siege to Fort Derawar and to destroy the walls by mines. However, the Arghuns placed their shields on their heads and scaled the high walls, sword in hand. Fort Derawar was carried by assault. The defenders were slain and the treasure divided between Shah Hussain and his army.

The Arghuns, however, soon ended the Langah Dynasty. Concurrently, part of Bahawalpur was held by other rulers, of whom the Nahars were the most prominent. In A.D. 1481, *Hajji* Khan of the Mirrani Baluchis conquered part of their territory and founded Dera Ghazi Khan.

In A.D. 1554, Shah Hussain died and the Arghun Dynasty became extinct.

After the death of Aurangzeb in A.D. 1707, the Hans tribe conquered the Dhuddis of Umarpur, now in the Montgomery District. During the time that Farid Khan revolted time and again against the Mughal governors of Multan, the Dhuddis rose to power. Prior to the Daudpotras, the forts of Winjhrot, Bhimwar, Derawar, Marot and the country around the two latter belonged to Jaisalmer.

Upon his deathbed, Amir Muhammad Channi Khan directed that the turban of government (*dastar-i-amarat*) should be placed on the head of his son Muhammad Mahdi Khan and that the Quran and sacred relics (*tasbih*) should be given to his other son, Daud Khan. The elder son died shortly thereafter and the two claimants became his son Kalhora and the Amir Daud Khan. Thus arose the division of the Abbassis, the former being known as Kalhoras, the latter, Daudpotras.

After many years of dispute, the Abbassis subdued several small States to weld them into one kingdom, later to become Bahawalpur. In A.D. 1748, Nawab Muhammad Bahawal Khan I founded several towns including Bahawalpur. He died in 1749, and being without male issue, his younger brother Mubarak Khan became Nawab.

The succession was as follows: Bahawal Khan II (1772–1809); Sadiq Muhammad Khan II (1809–25); Bahawal Khan III (1825–52); Fatteh Khan (1852–58), and Sadiq Muhammad Khan IV, who was only 4½ years old, ruled under a British Agency until invested in 1899. He died in the same year. His eldest son, Muhammad Bahawal Khan V, Nawab of Bahawalpur, was born October 23, 1883.

Population

The following figures were available:

Census	*Men*	*Women*
1871	267,369	219,346
1881	314,395	259,099
1891	355,153	294,889
1901	395,684	325,193

In 1902, Bahawalpur Town had 10,746 males and 7,800 females. In 1955, the estimated total population of Bahawalpur State was 2,000,000.

Recent data on the ethnic composition were unavailable. However, with the exception of the Hindu exodus following Partition, the following groups, as reported in the *Gazetteer* (1902), were still dwelling in Bahawalpur, although the numbers have changed.

Tribe or Caste	*Group*	*No.*
Daudpotra	Semitic	19,383
Biloch (Baluchi)	Semitic	21,657
Jat	Rajput and Indo-Scythian	66,523
Arain	Indo-Scythian	38,449
Kharal	Rajput	5,738
Pathan	Afghan	10,787
Khokhar	Rajput	16,580
Machchi	Indo-Scythian	23,133
Joya and Wattu	Rajput	106,309
Kirar (Arora)	Aryan	73,310

1) The Daudpotras are a scion of the great Abbasside Dynasty receiving their name from Daud Khan II, a lineal descendant of Sultan Ahmed II who, about A.D. 1317, marched into Sind, entering India through Kech and Makran. The Chief, Amir Sadiq Muhammad

Khan I, founded Bahawalpur State early in the eighteenth century and his descendants have ruled it since. The list of their Sections is as follows:

(*a*) Pirjani (Chief)
(*b*) Marufani
(*c*) Hilani
(*d*) Jamani
(*e*) Bakshani
(*f*) Tayabani
(*g*) Mamdani
(*h*) Ghamrani
(*i*) Kehrani
(*j*) Arbani
(*k*) Fatani

2) Biloch with tribal leader (*tumandar*).

(*a*) Ahmadani
(*b*) Chandiah
(*c*) Dashti
(*d*) Darishk
(*e*) Gashkori
(*f*) Gopang
(*g*) Jatoi
(*h*) Rind
(*i*) Khosa
(*j*) Lashari
(*k*) Mazari

3) Jats.

(*a*) Dahar
(*b*) Gujjar
(*c*) Vains
(*d*) Pannoh
(*e*) Langah
(*f*) Sapra
(*g*) Danuwaraj
(*h*) Dha
(*i*) Naich
(*j*) Waran
(*k*) Utra
(*l*) Unnar
(*m*) Kulyar
(*n*) Kamboh
(*o*) Missan
(*p*) Hamshira
(*q*) Channar
(*r*) Phore

4) Arain.

(*a*) Sahga
(*b*) Dhanun
(*c*) Dhote
(*d*) Kamboh
(*e*) Baghban

5) Kharals. Rajput tribe. Origin traced to Raja Karan of Hastanpur. Families.

(*a*) Lakhera
(*b*) Opaira
(*c*) Rubera
(*d*) Gogera

6) Pathans. Migrated into Bahawalpur at the time of Muhammad Bahawal Khan III. Farmers.

(*a*) Sadozai
(*b*) Khakwani
(*c*) Badozai
(*d*) Tarin
(*e*) Alizai
(*f*) Bamozai
(*g*) Babai
(*h*) Malezui

7) Rajputs. Claim Quraishi descent.

(*a*) Lakhwera
(*b*) Laleke
(*c*) Wazirke
(*d*) Fatwere
(*e*) Tughwere
(*f*) Akerke
(*g*) Sanatteke
(*h*) Kasamki

The Wattus are Bhatti Rajputs. In Minchinabad Kardari are the following subdivisions:

(*a*) *Gadhoke*
(*b*) Ratteke
(*c*) Chakkoke
(*d*) Malkane
(*e*) Ahhoke
(*f*) Sahru
(*g*) Jodheke

8) Khokhars. Farmers. Rajput extraction, some claiming descent from Qutab Shah, Quraishi.

9) Machchi claim to have come from Aleppo. Also known as Takrani and Solgi. First came to Sind, later part came to Bahawalpur during the reign of Sadiq Muhammad Khan II.

10) Kirars or Hindus are mainly Arora Section divided into:

(*a*) Sindi
(*b*) Dahra
(*c*) Utradi
(*d*) Dakhna

Traders, but taking to agriculture.

Languages. In 1902, the languages used were: (*a*) Multani or West Punjabi; (*b*) Punjabi (Jatki or Obhechar); (*c*) Sindi; and (*d*) Mariwari Rathi in Cholistan. In 1955, the chief language spoken is Bahawalpuri, which is identical with Multani Jatki or western Punjabi. The official language with which business is carried on is Hindustani (Urdu).

Religion. The Moslems belong mainly to the Hanfi Sect; there are a few Shiahs. The 1902 Census gave the following religious groups: (*a*) Moslems (598,139); (*b*) Hindus (114,670); (*c*) Sikhs (7,985); and (*d*) Christians (89).

Land Tenure. Sons divide property equally; the daughters receive no share. If there is no male issue, the widow and daughters are entitled to shares in the land. Cultivation is often by tenants, who receive a one-third share.

Laborers. The principal laborers are the carpenter (*turkhan*), blacksmith (*lohar*), potter (*kumhar*) and winnower (*chhaji*).

Moslem Dress. Men wear heavy turbans of about 20 yards of cloth twisted like a rope, a loose *kurta*, a flowing *shilwar* and a scarf (*chadar*). The women wear a *chalu*, scarf (*lopatta*) and a flowing *ghagra* reaching to the ground.

Staple Foods. Bajra, wheat, rice, vegetables, milk and *lassi.*

Public Health. In general, the health is relatively good. Marked improvement is shown during the past decade as a direct result of improved medical care.

Even at the beginning of this century, cholera in epidemic form was rare. Kidney stones are frequent. Diseases of the spleen are more virulent than in neighboring areas. During August–September, fever is common; these months are called *Ayyam i-Sura* (=

"days of epilepsy"). During the cold and windy winter months, pneumonia is the cause of protracted illness, often death.

TABLE 116. INFIRMITIES IN BAHAWALPUR, 1881–1901

Year	*Insane*	*Deaf Mutes*	*Blind*	*Lepers*
1881	379	544	2,476	71
1891	295	354	1,887	30
1901	240	607	1,512	96

During 1953–54, about 500,000 persons were vaccinated against smallpox. As a result of frequent dust storms, the incidence of eye diseases is very high. Bahawal Victoria Hospital, which now has 300 beds and many modern appliances, organizes seasonal eye camps.

SUPERSTITIONS

Birth. If a woman does not conceive for a long time and later becomes pregnant, she is forced to give birth to her child in a jungle which is afterward set on fire. This is believed to prevent the evil effects of the birth.

A Hindu woman with child was not allowed by her relations to cross a river by boat, since that would cause abortion.

If a woman does not conceive until 7 years have elapsed after the first delivery, it is believed that she gave birth to the child at the same time that a tigress brought forth her young.

If a mare brings forth her offspring in the daytime, it is considered unlucky. The remedy to avert the evil effects is that the ear of the colt or filly is bored or the tip of the ear cut off. I saw a mare's ear thus mutilated at a *toba* east of Yazman in Cholistan.

Magic, Spells and Charms. If anything goes wrong, it is believed to be bewitched (*bandhna*) by an enemy, and those skilled in combatting magic are called in to undo the mischief by charms. However, a dyer whose indigo is spoiled, retails some gossip or rumor he has heard in a very exaggerated form, and then his indigo recovers its color.

Many children's diseases, such as convulsions (*umm as-sibiyan*) are ascribed to demons and Bhangis and Chubras are employed to exorcise them, because they are believed to be in some way connected with these castes.

Sometimes a vermin (*labana*) is tied in a cloth around the neck to stop convulsions.

Diseases of the female brain and womb are ascribed mainly to demons and genii, such as: *paret, bhut, pashaj, dit, rakhash, dain, churel, dakan, shakan, pari* and *dev;* these occasionally possess men.

Khetr-palji's temple at Uch is a famous place for casting out devils. The process usually requires a day, but may last a month.

Scorpion-bite is cured by proxy. A man goes in behalf of the person bitten to the exorciser and the latter blows a spell on to some water, which the proxy drinks. This cures the sufferer. The spell runs:

> Ismun, Nismun [these words are the whole secret of the charm], the scorpion bit, but the scorpion will be killed: I will give water to the person who was not bitten, and the person bitten shall be cured.

The following incantation (*mantar*) is used for the diseases therein specified:

1) "Bantari gave birth to Sawant on the other side of the river, whereby ulcers, abscesses, toothache, ophthalmia and swellings of the breast departed." If the right breast be swollen, the left is exorcised, and vice versa.

2) The Khaggas and Bodlas are believed to be able to cure hydrophobia by blowing upon the patient. The latter also use the following charm (*kalam*):

> I begin first with the name of God, then with the name of Muhammad, the prophet of God, then with the names of the four Khalifas. The word is of God, with the permission of Badshah Dastgir [Shaikh Abdul Kadir Jilani] and of Sultan Sayyid Ahmad Kabir; may the person bitten by a mad dog or jackal recover by the blessings of Makhdum Jahaniyan.

3) If a crop of wheat, gram or maize be attacked by insects, a charm is recited to avert injury, or a camel's bone burnt so that the smoke may drift over the crop, a *kalam* being also read. The following charms are in use:

> Kungi, Kira, Mula and Bakhra are brothers and sisters; by the command of God a wind blew and drove them all away.

The following is recited and blown over the diseased crops:

> Kungi, Kira, Bakhra are brothers and sisters; the bread of one who does not pray was carried away by the wind.

Meanwhile the owner walks around the field, eating fried wheat. If he meets anyone, he gives him the wheat, but must not speak to him. When the grain has been threshed by the cattle, the owner digs a trench around it, which he fills with water. No one may enter this circle, which protects the crop from the evil spirit.

4) Blight is averted by hanging a pot on a long stick in the field, the pot being filled with earth from a Saint's tomb.

5) In selecting a place for a stack of corn, a pit is dug and the earth excavated is put back again. If it exactly fills the pit, this place is unpropitious and another is chosen. However, if some earth remains after the pit is full, the corn is stacked and the grain winnowed there.

6) Many cultivators draw a line with a knife around the pile of grain to prevent genii from eating it. After winnowing, if the grain appears less than the husks, it is believed that some evil spirit has stolen the grain. A ram or a he-goat is killed and eaten jointly by the farmers to expel it. Such genii assume the shape of ants or other insects. Thus, when the husks have been separated from the grain, the ground around the heap is swept and no insect allowed to get into it.

7) The following lunar dates are considered unlucky. Farmers do not begin reaping on the third, eighth, thirteenth, twenty-third and twenty-eighth of the month. However, it is not considered unlucky to continue if reaping has begun. The earth is believed to sleep on the first, fifth, seventh, ninth, tenth, twenty-first and twenty-fourth days of the lunar month. No agricultural work should be begun on these days or failure will be the result. Sunday is regarded as a lucky day to begin cultivating or watering the fields, sinking or working a well, or reaping. Hindus stop all field work on a Tuesday, as it is "the son of the earth," and neither till, plow nor reap on that day. Thieves believe that if they commit theft on Friday, they will be caught.

8) When cattle or horses are diseased, they are often taken to a Saint's shrine and the owner is told in a dream what means will effect a cure. Sometimes the *mujawar* of the shrine hears a voice from the tomb or the cattle get frightened at night and run away; in either case it is expected that they will recover.

9) In the Ubha the following *mantar* is used in cases of hoof-and-mouth disease:

> Suranjit has three sons, Dar, Dathar and Buhara. The sins of Biwi Bai shall sink her down [i.e., she will be annihilated] if she lives at all in this world.

In the Lamma this disease is called *muhara* and to cure it the shrine of Jetha Bhutta is favored. If certain grazing does not agree with the cattle, the *mullah* blows into each animal's ear, reciting 7 or 11 times the proper incantation (*mantar*).

Animals. The following horses are unlucky:

a) A horse or mare with a white spot, small enough to be covered by the thumb, on the forehead. Such a horse is called *tara-peshani.*

b) A horse or mare with 3 feet of one color and the fourth of another. However, a white blaze on the forehead counteracts this evil sign. Such an animal is called *arjal.*

c) A horse with a black palate, called *siah kam asp* from the Persian.

d) A horse with both hind feet and the off forefoot white. However, a white near forefoot is a good omen, as in the Persian couplet:

> A horse with two white [hind] feet and a white near forefoot is worthy to be ridden by a king.

e) A horse or mare, which is walleyed (*manki*) or which has an eye like that of a human being, is called *taki.*

To hear a donkey bray from behind when one is starting on a journey, or a partridge call on the left, is an omen that the journey will fail. However, a partridge calling on the right is lucky. Good fortune will ensue if one meets a road sweeper carrying dirt or a coffin on its way to the cemetery.

It is a good omen to see a bird, called the *malhala,* on the right hand early in the day and on the left later.

If a thief hears a pheasant on the left he considers it a bad omen and returns. If a *maina* (*lali*) be heard warbling on the roof the women reply, "The flour is ground, invite the guest" [i.e., a guest is expected]. The bird's note is supposed to resemble *piho,* the imperative of *pihna* (*pisna*) = to grind.

If a man sneezes when starting on a journey, the journey will be unsuccessful. Similarly, it is a bad omen for a marriage procession to hear the roar of thunder or encounter a gust of wind on their way to the bride's house.

Any additions to a house are made by the Hindus in front of, or in line with, the buildings that exist; not in their rear. A new building at the back of the house is calculated to bring some calamity on the owner's head.

A crow on the coping denotes that a relation is coming on a visit, or at least that news from one will soon arrive. On the other hand, if a woman is hurt, she will ascribe it to having heard a crow cawing in the coping. A kite sitting on the house is unlucky, so a black scarecrow (*handi*) is usually hung on the highest part of the roof.

Travel. Certain days of the week are inauspicious for travel and the rules are given in the verse:

> Do not go toward the West on Sundays or Fridays,
> East on Saturdays or Mondays, North on Tuesdays
> or Wednesdays, or South on a Thursday.

Both Hindus and Moslems believe in the *Chihil-Abdal,* 40 Saints who live in different directions on the various dates. Their number is invariably forty. If one of them dies, a new Saint takes his place. To undertake a journey on the dates when the Saints are in that direction is unlucky. Farmers do not reap facing in the direction of these Saints.

Sacred Trees. If a young tree is peculiarly flourishing or vigorous, it is dedicated to a holy man (*pir*) or even called after his name, and offerings are made to it. Villagers often visit such a tree in small groups. Gradually the tree is supposed to become the Saint himself and to distinguish it, a flag is fastened to it. The *pir* chosen in such cases is the one most implicitly believed in by the villagers.

Death. The five days during which the moon remains in Aquarius (*Kumbh*) and Pisces (*Min*) are termed *panjak* (from *panj* = 5). Among the Hindus, if a person dies during the *panjak,* the following ceremony is performed:

> As many dolls are made of cloth or of the *darabh* (*dabh*) grass as there are days remaining in the *panjak.* These are placed in the coffin with the dead body, and burnt with it. For example, if a person dies on the second day of the *panjak,* 3 dolls are made and burned with the corpse, if on the third day, 2 dolls. The belief is that if this be not done, as many members of the family will die as there are days left in the *panjak* period. The body of a person dying during a *panjak* is not taken out of the house by the door, but a large hole is made in the wall over the door and the body is taken out through it. Hindu women wear ornaments on the *panjak* dates, the idea being that they will receive as many more ornaments as there remain days before the expiration of the *panjak.*

Some village Moslems believe in the *panjak,* but according to them, a person dying during the first or last 5 days of a lunar month is said to have died in the *panjakan,* and the belief is that 5 or 7 members of the family must then die. The following measures are taken to avert this calamity:

a) While carrying the coffin, they sprinkle mustard seed on the road to the graveyard.
b) Blue *pothas* (small beads used by girls for decorating dolls) are put into the mouth of the deceased.
c) A piece of the *ak* plant is buried with the body
d) After the body is buried, an iron peg is driven into the ground outside the grave toward the head of the deceased.

If a person dies during the *panjak* and his relations, being aware of the *panjak,* omit the above ceremonies at his funeral and deaths ensue in the family, the relations exhume the body. Some Moslem Jats believe that the deceased will by then have grown long teeth and be seen eating his shroud. Some cut off the head of the corpse; others think it sufficient to drive a nail into the skull.

EXPEDITION TRAVERSES

We arrived in Bahawalpur by train from Quetta on April 12, 1955. This town (Latitude 29° 22′ North and Longitude 71° 41′ East) lies 3 miles south of the Sutlej River, which is spanned by the "Empress" Bridge (4,258 feet), opened June 8, 1878. As guests of the

Nawab, His Highness Alhaj Sir Sadiq Muhammad Khan V Abbassi Bahadur, we were shown to the Government Guest House. Arrangements for our reconnaissance in Cholistan were made by the Adviser to the Ruler, Alimartabat Abdur Rashid Khan.

1) *Bahawalpur Town.* Since its founding about 200 years ago, Bahawalpur has grown into an extensive community with superb shade trees. Modern improvements in building are in full swing. Turning to the historical record, we find that in A.D. 1748, Nawab Bahawal Khan I raised a wall around the villa of Muhammad Panah Khan Ghumrani and within it built a town, which he named Bahawalpur; this replaced Derawar.

Elphinstone, who visited this town in 1808, wrote (*Cabul,* 1810, vol. 1, p. 23):

> We passed for a mile and a half under the walls of Bahawalpur, which, as well as the roads, were crowded with spectators who, in their turn, afforded no uninteresting spectacle to us. A striking difference was observable between them and the people on the east of the desert. Those we now saw were strong, dark, harsh-featured; had their hair and beards long; wore caps oftener than turbans; and spoke a language entirely unintelligible to our Hindustani attendants. The better sort wore the dress and affected the manners of Persia. After crossing a small canal, and passing through some fields we left the woods and at length reached the banks of the Hyphasis. I was much disappointed in the breadth of the river as well as in the appearance of its shores; but it was impossible to look without interest on a stream which had borne the fleet of Alexander. On the next day but one Bahawal Khan arrived, having come 40 miles on purpose to show attention to the Mission. We rode out often during our halt at Bahawalpur and saw the town and its environs. The town is about 4 miles in circumference, but there are gardens of mango trees within the walls. The houses are of unburnt bricks with traces of mud. The city is of mud and very thin. Bahawalpur is remarkable for its *loongees,* or silken girdles and turbans. The inhabitants of this and all the neighboring countries on the west and north are principally Jats and Biloches, who profess the Muhammadan religion.

Masson, who came in 1827, wrote (1842, vol. 1, pp. 21–22) as follows:

> Bahawalpur is seated about two miles from the Garrah. It formerly had walls, the indications of which only exist, and are used as a walk for the inhabitants. The houses are chiefly constructed of kiln-burnt bricks, and are very much mixed with gardens, the whole is arranged in a loose straggling manner, and is on all sides encircled by grove of date and pipal trees. The public buildings are not very remarkable, neither are any of the Khan's palaces attractive residences. There is, indeed, a handsome stone *masjit* in progress of erection. This town is the seat of many manufactures, some of them costly, and has a large trade.

At the beginning of the twentieth century, Bahawalpur was about 3 miles in circumference and surrounded by gardens. The roads were lined with fine trees, mainly *sarinh* and *shisham.* The town had 6 gates: the Shikarpuri, Bohar Darwaza, Multani, Bikaniri, Ahmadpuri and Derawari.

During the first few days in Bahawalpur, I began to compile data on Bahawalpur State and in particular on Cholistan, the desert area through which the great Haqra River once flowed. The latter was the purpose of our visit.

It was decided to make a brief reconnaissance survey (map of Cholistan) from Fort Derawar to Fort Abbas to search for traces of ancient occupation along the Pakistan frontier with Bikanir.

The following maps (figs. 17–18) show the range and distribution of Indus civilization sites.

Arrangements were finally completed and Mr. M. Chaudhry, Cholistan Development Officer, was assigned to guide us in a Jeep across Cholistan. Sardar Mohammad Rahim Khan Leghari, Inspector General of Police, arranged for a Jeep escort.

2) *Bahawalpur Town to Dera Nawab Sahib.* On April 18, at 0530 hours, we left with two Jeeps. Mrs. Field, Mohammed Idris Saddiqi and I rode in the lead car. We followed the paved road from Bahawalpur Town to Dera Nawab Sahib, a distance of 34 miles. Trees lined the road the greater part of the way. The road crosses a flat plain, with cattle and crops on each side.

At Mile 34, we entered Dera Nawab Sahib, known also as Dera Mubarak or Dera Mwala ("the high").

The rulers of Bahawalpur from Nawab Bahawal Khan II to Nawab Bahawal Khan IV had 3 capitals, at Bahawalpur, Ahmadpur and Derawar. Ahmadpur was their favorite resi-

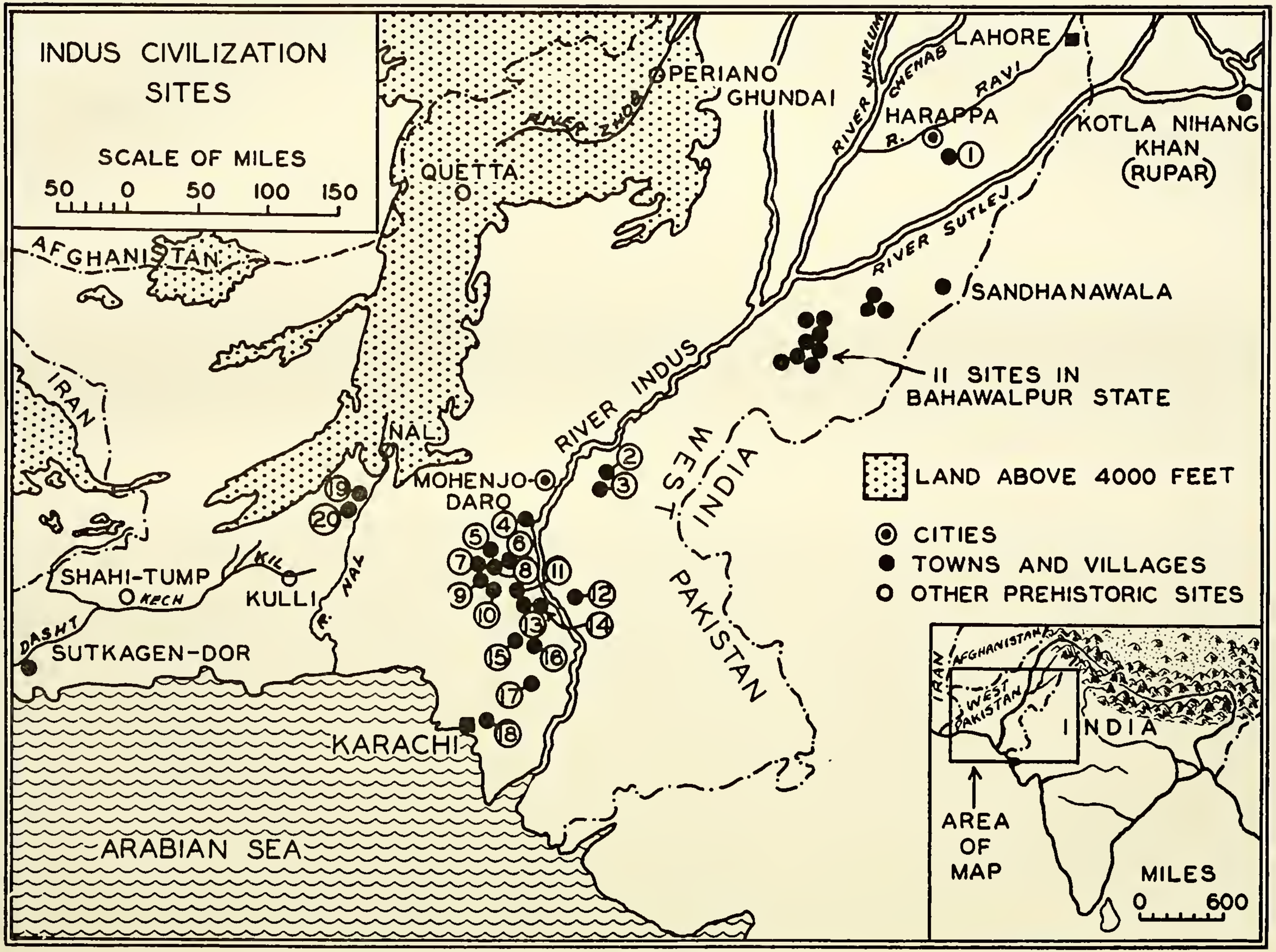

Fig. 17. Indus civilization sites (*after* Stein).

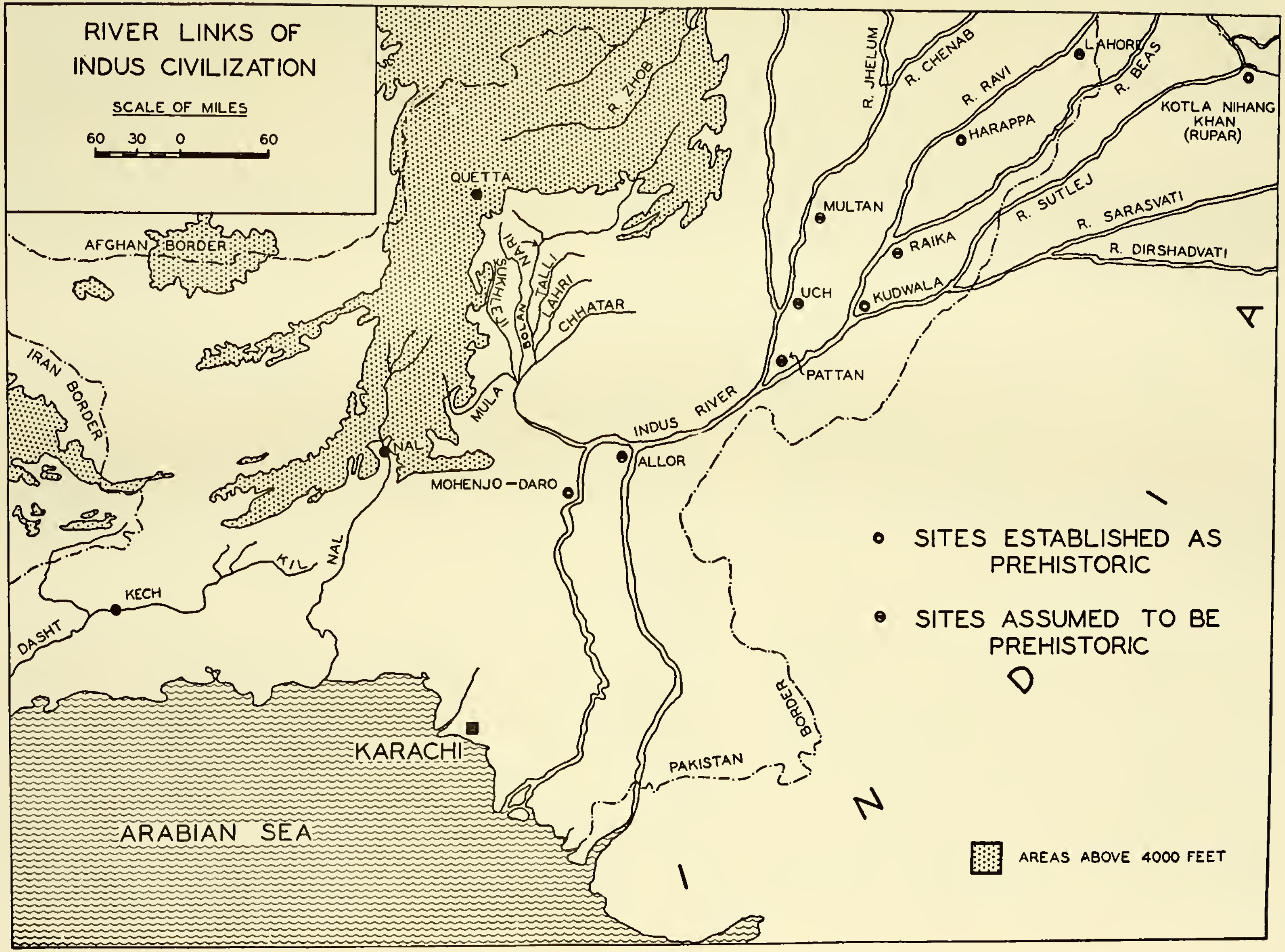

Fig. 18. River links of Indus civilization (*after* Stein).

dence. None of them, however, lived in Dera Nawab Sahib except Nawab Bahawal Khan II, who, during his halt at Ahmadpur, lived in the fort built by him in A.D. 1782.

We passed the Nawab's palace on the left, and continued through the town, turning left and winding between mud houses along narrow streets to a chained gate. This was the entrance to Cholistan.

3) *Dera Nawab Sahib to Fort Derawar.* The sandy track, bounded by an avenue of trees and with a drainage ditch on each side, continued across flat country due south. We passed many flocks of sheep in thorn-enclosed kraals. The following birds were recorded: doves, pigeons, mynahs, jackdaws and magpies.

At Mile 51, 17 miles south of Dera Nawab Sahib, we entered the desert area of eastern Bahawalpur, called Cholistan or Rohi. Attention is called to the fact that in Arabic *chol* = desert; therefore, *chol-istan* = "the land of the desert."

After crossing hard sand amid hillocks and bushes and a few low, scattered trees, we came, at Mile 59, to a low mound covered with broken sherds. This archæological site (No. 1) is called Traikoa- (Trakwa or Trekoe-)Thar. The low mounds did not rise more than a maximum of 4 feet above the plain level, but the pottery covered about 4 acres. Here, during a brief halt, we collected a representative series of unpainted sherds, some with a red slip. We also picked up a few shells and 2 chert flakes with worn arrêtes.

From this point, the silhouette of Fort Derawar lay directly ahead to the south. We continued over a well-defined track amid golden sand dunes 6–15 feet high. The track led past Fort Derawar, now 500 paces on the right. White-domed tombs enclosed by walls lay directly ahead amid trees. These are the Abbassi tombs where many of the ancestors and one of the wives of the present Nawab of Bahawalpur are buried.

We halted outside the Abbassi tombs, a distance of 30 miles south of Dera Nawab Sahib. The time was 0840 hours. Fort Derawar stands impressively solid about 1,000 paces to the northwest. In the distant foreground loomed a white mosque whose twin minarets stood out against the dark brown battlements beyond.

We were invited to take off our shoes and enter through a wooden portal into the courtyard, where the gleaming white tombs (fig. 70) contrasted with the azure sky. We walked into the main building with its white marble interior and a mirrored ceiling. Here were the tombs of the present Ruler's father and grandfather.

Outside and around to the south stood another gleaming white tomb with a marble tracery retaining wall, giving the effect of white lace. Here lay the remains of the present Ruler's English wife, who begged to be buried "at his feet." Since, by tradition, she could not be inside the main mausoleum, she was just outside near the space provided for the Ruler when he dies.

We were informed that the Nawabs of Bahawalpur conquered Fort Derawar in their first wave of invasion and lived nearby until they built Dera Nawab Sahib. Since then, all the Nawabs and their families have been buried here. The retired wives were maintained here until released by death.

After driving north toward Fort Derawar, we turned left through very narrow twisting streets amid mud huts, the majority in complete ruins.

We drove up to the main gate of the Fort where the Commandant, Captain Mahmud Baksh, greeted Mr. Chaudhry and invited us to visit the Fort after we had seen the great archæological mounds overlooking the dry bed of the Haqra River.

As we turned southwest back into the village, we passed a man carrying a wooden spindle whorl with 4 legs protruding from a ball of coarse brown camel wool thread. Seeing my interest, he handed it to us, refusing any money. This spindle whorl is called *ghera* in the Multani language.

We drove about 1,000 paces north, past a mosque and graveyard, across a vast pottery-strewn plain to the top of a mound (450 x 150 x 8 feet). From the summit, the dry channel of the broad, flat Haqra extends to the northwest–southeast. The nearest point to the ancient river bank lies about 2,000 paces distant. Here we spent about 30 minutes collecting sherds, including some fine painted pottery (Site No. 2). This is a vast ruin with tens of thousands of red sherds scattered over the chain of mounds and far out across the plain, extending from the base of the mounds particularly to the north. Excavations here would require about 50 men for 30 days in order to drive a trench through the highest section of this mound. This would undoubtedly result in the discovery of some complete painted ware and other household objects.

Between this high point on which we stood and Fort Derawar another mound about 25 feet high rose above the plain. A deep trench ran into its heart. We drove the 100 yards across the plain to this mound, the nearest one to the modern village, to examine this trench (75 x 25 x 15 feet), cut in 2 weeks by Sir Aurel Stein about 12 years before. Here (Site No. 3) we collected many painted sherds which had weathered out from the débris. This must have been a mound rich in beautiful pottery. Mr. Chaudhry had guided Sir Aurel Stein to this ancient site. During our brief visit, I could not see why the latter had selected this area for his trial trench in preference to the highest point of the long chain of mounds beyond.

At 1000 hours, we left Site No. 3 and drove back into Fort Derawar, where Mahmud Baksh of the Boga-Rind tribe of the Baluchis entertained us. The Captain was about 5 feet 7 inches tall, had a powerful figure with a barrel chest, a round head with a convex nose, very dark brown hair, dark brown eyes and a swarthy skin. He was very reminiscent of the Rinds whom we had seen at Mand on the Baluchistan-Persian frontier some weeks before.

We were entertained in the breezeway just inside a brick tunnel (35 x 16 feet) leading back up into the Fort.

The following account of Derawar is taken from the *Tarikh-i-Murad*, which is based on the Shastri Chronicle of Mauji Ram Bias, whose ancestors were the family *parohits* of the Bhati rulers of Derawar.

Jajji and Deva Sidh were two Bhati Rajahs, Deva Sidh being the son of Jajji's sister. In 300 Hijra, Jajji ruled over the modern Tehsils of Khanpur and Ahmadpur East. In Sambat 900 Jajji founded the town of Jajji, still a village of considerable importance. The Indus is said to have then flowed close to the town, but it now runs 10 miles west of the village. Deva Sidh, also called Deva Rawal, or simply Rawal, built a fort in the bed of the Haqra in the Cholistan with the consent of Jajji Bhatia, in Sambat 909, and gave it his own name; but Jajji, from jealousy, ordered his nephew to discontinue building. Deva Rawal's mother, Jajji's sister, however, interceded and wrote to Jajji:

> The sister of Jajji informs him that Bhutta and Bhatia are one and the same; let the fort be built.

No sooner was Jajji's permission thus secured than Deva Rawal hastened to complete the fort and 40 battlements or towers were built, 20 *kachcha* and 20 *pakka*. One tower to the left of the main gate was called the Kakuha after an architect of that name. A *pakka* well was dug in the Fort, and a tank outside it to collect rainwater. The Fort had a gateway, just opposite to which a room was built, and these were fortified with an iron gate.

From Sambat 909 to 1790 the Fort remained in the possession of Deva Rawal and his descendants. On the 20th of Ziqad, 1146 A.H. Nawab Sadiq Muhammad Khan I dispossessed Rawal Rai Singh and occupied Derawar. The descendants of Deva Rawal, who held the Fort until the time of Rawal Rai Singh, were: (*1*) Deva Rawal, (*2*) Ludda, (*3*) Bachhu, (*4*) Dosawa, (*5*) Jaisal Ji (the founder of Jaisalmer), (*6*) Kalyan Ji, (7) Chachu Ji, (*8*) Thej Rae, (*9*) Jit Senh, (*10*) Mul Raj, (*11*) Deo Raj, (*12*) Kehar Ji, (*13*) Lakhman Kailun, (*14*) Bairsi, (*15*) Chachu Ji, (*16*) Devi Das, (*17*) Jit Senh, (*18*) Laun Karan (*19*) Mal Dev, (*20*) Bhaun Singh, (*21*) Ram Chandar, (*22*) Dal Sahae, (*23*) Madhe Singh, (*24*) Kishan Singh, (*25*) Rawal Rai Singh.

Although in Sambat 1804 Rawal Rai Singh retook Fort Derawar from Nawab Muhammad Bahawal Khan I, in Sambat 1816 he voluntarily made it over to Nawab Mubarak Khan on condition that the latter pay him half the income from the tolls (*zakat*). Until Sambat 1842 Rawal Rai Singh and his son Rugnath Singh received the stipulated sum; but after the latter's death, his son Zalim Singh was content to receive Rs. 50 per mensem as a gratuity, which he and his son Bhum Singh continued to enjoy until A.D. 1833 when it lapsed on the latter's death. The descendants of Bhum Singh, who lived in the foreign territories, never laid claim to the concession, but when a representative of the family appeared in the court of the Nawab he generally received a special gift (*khillat*).

4) *Fort Derawar to Fort Abbas.* At 1030, with the speedometer at Mile 70, we left Fort Derawar with the 2 Jeeps and drove down through the narrow maze of streets amid ruined mud houses, back toward the Abbassi tombs, then east across the plain to the track from Dera Nawab Sahib to Fort Derawar.

Here we turned north on this track for about 1 mile and then east on a poorly defined track impossible to find without a guide, for many faint single tracks crisscrossed this sandy plain. About 2 miles from Fort Derawar, we reached a canal which runs almost due east and west. Here we turned onto a well-marked track beside the southern bank of this canal. We stopped to collect several types of small shells lying on the southern bank of the canal. Mrs. Field photographed some camels grazing on tall bushes nearby. Their brand was a circle surmounted by a small circle on the left side of the head (*see* Appendix O).

We continued due east beside the canal, passing hundreds of camels grazing on the plain to the north. The track followed a line of low sand dunes with many bushes, around whose roots sand had collected to form hummocks.

At Mile 75, we left the canal, turning southeast across a rough, sandy patch. Plowed furrows 15 feet apart delimit the tracks across a white, sandy mudflat. As we drove across a wide mudflat, we saw 2 gazelles, a male and female, before they bounded out of sight.

At Mile 80, we drove across a flat spot with broken pottery (Site No. 4). No mound was visible, so we did not stop. Shortly afterward, we saw 2 more gazelles far in the distance.

At Mile 82.5, we halted for 20 minutes at a low, spreading mound about 15 feet high and covering 6 acres, about 100 yards north of the track. This is known as Sulla mound (Site No. 5). Here we collected plain ware, none painted; there was no chert nor flint.

More unpainted sherds (Site No. 6) covered the ground for a few acres at Mile 84. Since no mound was visible, we did not stop. A single plowed furrow on the right demarcates the correct track for about 100 yards.

After crawling through deep sand for about 500 yards, the track continued straight due east across sand and gravel patches and amid scattered bushes and a few trees. Here we saw a female gazelle and shortly thereafter, a frightened mother and baby gazelle dashed away from the thundering monsters. A yellowish-green lizard, about 7 inches in length with a broad tail, scampered into a hole beside the track.

We veered right to cross part of the dry, flat Haqra River channel, with no vegetation for about 4 miles. At this point we were 14 miles east of Fort Derawar. Many mirages were visible. Sandy patches alternated with gravel plains. In a rough, sandy section we sighted a male gazelle close to a "sand devil" which swirled upward. In the distance the silhouette of a village came into view to the southeast.

At Mile 89, time 1205, we stopped in Channan Pir village. Here we rested for 2½ hours in a mud hut with 2 small rooms. The ventilation was by holes just below the roof, but it was blistering hot—at least 100° in this shade and the air entirely motionless.

We talked with several villagers including the Headman. They did not look like Arabs nor Baluchis. They had dark brown hair and eyes and were of medium stature. Their faces were medium wide and medium long and their noses were either straight or slightly convex. Their teeth were good; their complexions swarthy and sunburned. Their bodies were neither husky nor gracile; the muscular development was excellent.

Elizabeth Balneaves (1956, pp. 71–72) gives an account of the legend of Channan Pir in the following words:

> The story of the saint of Channan Pir is curiously reminiscent of Ishmael, and as we drove out amid strings of camel caravans, herds of sheep and goats and great carts pulled by snow-white oxen, my guide and friend Mir Mohammed, who was Development Officer for Cholistan, accompanying me, told me the story. The legend dates back four hundred years, and the Majawars, or guardians of the tomb of the saint on whose account the pilgrimage takes place, are now in their eighth generation. The legend has been handed down from father to son, and tells of a Hindu ruler called Sindharan, who, having no male issue, was driven in desperation to consult a Muslim *pir*, or holy man, living in the district, and begged

him to pray to his God that he, Sindharan, might be blessed this time with an heir, his wife being again with child. The *pir* consented, but warned the Hindu that the child would be a Muslim. Sindharan readily agreed, but when in due course his wife was delivered of a boy, true to all such legends, he conveniently forgot about the prophecy. However, before the child was many months old he astounded and horrified his parents by reciting verses from the Quran. Alarmed by these unnatural manifestations, and ascribing them to some evil spirit which had taken possession of the child, they carried the infant far into the desert and abandoned him at the foot of a *jand* tree. Perhaps torn between curiosity and anxiety, they returned some days later, expecting to find the child dead. Instead, they found him nestling comfortably in a sweet-smelling cradle of *chandan* wood, swinging gently from the branch of a tree. "You see, God has sent down the cradle," explained Mir Mohammed, his peaceful face smiling with happiness. Overcome with remorse, and realizing that some supernatural power had cared for their son, they determined to take him back with them, but each time they approached the cradle it was lifted up beyond their reach, and in the end they were forced to abandon their attempt to recover the child. In the years that followed the boy grew in wisdom and holiness and became famed far and near for his miraculous powers and the purity of his life. He was given the name of Channan Pir, Channan being a corruption of *chandan*, the wood from which the cradle was made. Pilgrims came from all over the country to consult him, and many were the miracles he wrought. It is firmly believed in this district today that any wish made in the name of Allah at the grave of the *pir* will be granted.

At 1430 hours, we turned west through low sand dunes across the track leading from Fort Derawar, past a water tank (*toba*) with about 100 camels nearby. We passed a ruined building (25 x 12 feet) with no roof, beside a broken brick bridge. Nearby we saw another male gazelle.

After crossing a very rough cultivated area and then over 3 acres of plowed land, we passed a square tower (20 x 20 x 15 feet) about 100 yards to the right. We were following a winding camel track amid low hummocks. A gray hawk (*baz*) hovered in the sky.

At Mile 106, after traversing sand dunes, we passed a village known as Chak 115 about 500 yards to the right. We were informed that in this area of Cholistan, the older villages still retain their names, but each village (*chak*) bears a number. They are thus marked on recent maps.

After traversing very rough plowed land with ruined buildings nearby, we came to Chak 119 on the right, standing amid a brilliant green patch of vegetation. At Mile 114, a mound was visible ahead on the skyline about 1 mile to the right. We turned left through sand dunes and across a flat plain to Dunkkian mound (Site No. 7). This is about 15 feet above the level of the plain and covers an area of about 5 acres. Here we collected many sherds, the majority with raised lugs. There appeared to be no chert and no flint. This mound was at Mile 116.5.

We drove 2,000 paces north to Turewala (Site No. 8), easily visible from Dunkkian. Here we collected similar types of pottery, also some with naturalistic designs, mainly animals. Again there was no chert and no flint. We saw a small green lizard. The time was now 1445 hours.

At Mile 121, we passed Mahariwala mound (Site No. 9), reportedly covered with sherds similar to those on Dunkkian and Turewala. We were unable to stop because of the lateness of the hour. Chak 6 lay on our left. Here there were many sheep, some horses and bulls.

We followed a well-marked track under thorn trees beside a canal. At Mile 123.5, we crossed a bridge over a canal (15 feet wide, 4 feet above water), and turned sharp right beside the Dera Nawab Branch Canal, which was 15 feet wide and full of water. This is a very well-marked track amid beautiful, large trees.

We passed Chak 7 on the left across the canal. Lurewala, a famous archæological site, lay 1,000 paces on the right. A large hawk hovered overhead.

At Mile 125, we turned off the track across some small sand dunes to Lurewala (Site No. 10), 1 mile east of Chak 140. Here we collected a splendid series of plain and painted sherds. This important site deserves a trial trench, and possibly large-scale excavation.

At Mile 126, we passed a small mosque on the right and entered Chak 140. We halted beside the main well (60 feet to water and 8 feet in diameter, faced inside with bricks). The villagers had smaller noses, more delicate features and lighter skins than the Baluchis.

The eyes and hair were uniformly dark brown. The noses were straight or slightly convex. The heads were mainly mesocephalic. However, among the dozen children crowding around the Jeep, 4 were brachycephalic. One old man had applied henna on his white hair and beard.

After a few minutes, we continued through a narrow, twisting track, back to the good road beside the canal.

At Mile 127, we were told that we were 10 miles from Yazman. The well-built road continued dead straight beside the canal (30 feet wide) under an arch of trees. The road continued under these beautiful trees, making delightful shade after the burning sun on Lurewala. This main canal is fed by the Sutlej River far to the north.

At Mile 137, we turned sharp right into Yazman Rest House. Time: 1830 hours. Here we stopped for the night.

We were informed that Rest Houses of exactly the same plan had been built every 15 miles along the main canals. These are used by Bahawalpur irrigation engineers who have to make constant inspections in this area. The majority of these inspectors travel by camel and, for this reason, the distance of 15 miles has been standardized. These Rest Houses are well built, with 2 double rooms and a dining room on the ground floor. The kitchen is in a nearby building. We did not go upstairs, but our host, the Police Commandant, informed us that the local mosquitoes do not attempt to get into the second story windows, hence screens are not used except on the ground floor.

On April 19, at 0730 hours, we left Yazman for Fort Marot on the way to Fort Abbas. We followed the same straight, narrow road due east along the southern bank of the large canal. The road continued straight with a hard, gravel surface, still under trees. On the right there was almost continuous cultivation.

At Mile 145, we passed Kudwala Rest House, which stands near a small, dry canal on the right.

At Mile 149, we turned left off the road to Kudwala (Site No. 11), a locally well-known archæological site consisting of several large mounds covering about 15 acres. The summit of the largest rises about 20 feet above the plain. The ground was covered with unpainted sherds with a few types of painted pottery. However, the surface material was very poor when compared to that collected on Lurewala. Here we halted for 30 minutes. From the top of the mound looking north, a magnificent double line of trees (40–50 feet) runs approximately northwest–southwest. We drove across the plain toward these trees to watch a sheepshearing. A flock of 100 sheep were being sheared by 8 men. The value of each fleece is about Rs. 2 and 6–8 annas. Each sheep is walked on its forelegs like a wheelbarrow to the shearer. This work is done by an itinerant professional group. The time taken for one sheep is about 5 minutes.

We returned to the track and continued south. The track continued across gravel and sand to Mile 156, where we passed near a small area covered with pottery. We did not stop.

At Mile 157, to the left rose a small mound called Guddul (Guttal). Mr. Chaudhry informed us that this mound is covered with pottery, but we were unable to stop. Guddul village lay 1,000 paces to the left.

After driving over sand and clay, then gravel and sand, with the track poorly defined but between plowed furrows 15 feet apart, we turned right at Mile 163 to a low mound (15 feet high) covering about 5 acres. This was Bhoot (Site No. 12). Here we collected some unpainted pottery. We then drove 1,000 paces to visit a catchment basin (100 x 100 x 5 feet) with mounds of excavated earth on 3 sides. This reservoir is said to be at least 100 years old. This water is used by the nearby villagers of Bhoot and their animals. During our visit there were large rents in the deep mud and only a few gallons of water in each of several small pools. Since the local shallow well water is brackish throughout this area, these *tobas* are of the greatest value. These catchment basins are similar to the Ar. *mahfur* (pl. *mahafir*) in northern Saudi Arabia (Field, 1951).

Bhoot village lies about ½ mile east. We drove southeast to a rectangular mud building with a huge, brick-faced well (70 x 12 feet) with 2 animal water troughs. This is one of the wells sunk by the Cholistan Development Scheme. Up to 1955, 11 similar wells had been dug; 6 were under construction. There is a brick kiln nearby.

Four men were watering their cattle. One man had a short, broad face; two had convex noses with narrow alae. The hair was uniformly dark brown, almost black. The skin was dark brown. Their stature was short, about 5 feet 6 inches.

Nearby two thorn trees gave shade to the cattle refreshed by the water. Two women were carrying coffeepots on their heads, but because of the foreigners, they awaited our departure in the shade, their 2 children clutching nervously at their skirts.

After a brief halt, we started back toward the main track, flushing a female gazelle hiding behind some thick bushes.

At Mile 168, we returned to the main track and turned east, crossing a mudflat and passing Januwala (Jangawala) village about half a mile on the left.

The track then crossed a rough gravel area, demarcated by 2 plowed furrows, and entered a sandy patch and then across gravel amid bushes, then over golden patches of sand to Mile 176. From this point, Fort Mojgarh (Maujgarh) lay directly ahead. The ruined tomb of Muhammad Maruf Khan (fig. 71) lay just to the right as we approached the main part of the Fort. Mrs. Field photographed the Fort from many angles, especially the magnificent brickwork (figs. 73, 75). Inside the courtyard (500 x 500 x 40 feet) lay thousands of bricks (fig. 74). A big mosque (figs. 72, 76) towered above the eastern end of the courtyard. We could find no entrance because of the vast piles of rubble. Some blue tiles still clung to the brickwork high above. Pigeons wheeled in and out of the towers. I collected 2 sizes of bricks and 1 piece of blue tile. Outside were 3 large *tobas,* 2 with water.

We drove back to examine the tomb of Muhammad Maruf Khan, 1,000 paces to the north, where I collected some tiles from the ground.

According to historical records, Fort Mojgarh was founded in 1157 A.H. by Wadera Maruf Khan Kehrani and his sons, Jan Muhammad Khan, Azmat Khan and Hamza Khan, on the ruins of a town called Lodbra. It was only half built when the Wadera died on the 15th of Rabi-ul-Awwal, 1171 A.H. He had, during his lifetime, built a tomb about 400 yards to the south of the Fort, and in this he was buried. Jan Muhammad continued the building of the Fort, distinguishing the new work from the old by inserting two lines of projecting bricks in the walls. It was not quite finished when he died, and his successor, Umar Khan, completed it, but died immediately afterwards.

Maruf Khan II now succeeded to the chieftainship and, on his dying childless, Khuda Bakhsh Khan, son of Nur Muhammad Khan (third son of Wadera Maruf Khan) held it. A door which forms the interior gateway of the main portico has several iron plates fixed on it, on one of which is the following inscription:

> Wadera Jan Muhammad Khan and Muhammad Maruf Khan are masters. This door was made by Sri Ram, ironsmith, in the month of Shawwal, 1212 H.

Elphinstone (*Cabul,* 1810, vol. 1, p. 24) writes thus of Mojgarh (Maujgarh):

> We descried the high walls and towers of Maujgarh, with a conspicuous mosque, which stands over the gateway, and a tomb with a cupola ornamented with painted tiles, resembling, as I was told, the tombs of Imamzadahs in Persia. We arrived a little after dark, and encamped near the fort, which is small and weak. We remained here for two days.

Masson writes (1842, vol. 1, p. 24) of Mojgarh as follows:

> Maujgarh is not so large a town as Marot, but its contiguous fortress is a lofty structure built of kiln-burnt bricks; on the western face the walls have been perforated with cannon balls which, we are told, happened in the siege it endured from the first Bahawal Khan. The apertures have never been repaired, being supposed evidence of the obstinacy of the defence and of the strength of the fortress. They, however, show its weakness, for they enable us to detect the slightness of the walls. East of the fort is a pool of water shaded by a grove of trees, amongst which is a huge *pipal,* an object of veneration to the Hindus of the town. At a slight distance to the north is a Muhammadan tomb, handsomely decorated with lacquered blue and white tiles.

At Mile 177 and time 1200 hours, we returned to the track leading east in a straight line between 2 plowed furrows across sand and gravel. We drove over a mudflat, then across gravel amid bushes, where we saw a male and female gazelle, and shortly thereafter another female.

At Mile 185, Khirsar village lay on the left across some small sand dunes. Nearby a small square ruin was seen on the left. A bleached camel skull lay on the sand. I stopped to collect this specimen for the Museum of Comparative Zoology at Harvard.

The road crossed sand and gravel patches, then a large mudflat between marked furrows.

At Mile 190, some pottery was seen on the slopes of a very low hill, but we did not stop. Two miles further we came to Chapoo village where we halted for 15 minutes so that Mrs. Field could photograph about 200 camels near a large watering place. There was also a flock of white lambs with black faces. Here I purchased for 4 annas a wooden nose plug used for guiding a camel.

We continued east across a large mudflat until Mile 196, where we crossed a concrete bridge onto an all-weather road lined with large trees. This is the point at which we entered the Canal Zone. Prior to leaving Bahawalpur, the Government had issued us a special permit to drive on this road. We continued due east on the south side and parallel to the dry canal. A mongoose raced across the road. We passed a white donkey with 3 large spots on its back and 4 bars on the right hind leg, all colored with henna.

At Mile 200, we crossed a concrete bridge near Marker No. 236. A large lizard (24 inches), probably *Varanus bengalensis*, was seen.

At 1450 hours and Mile 204, we stopped at Marot Rest House.

Five miles beyond, we turned right at Marker No. 242 into Fort Marot (29° 10′ North and 72° 28′ East) standing on the south bank of the Haqra (figs. 77–79, 81). Walking through extensive ruins, we saw elaborate carvings in yellow sandstone blocks, several lying on the ground in different parts of the Fort. The finest example of this carving is a pillar (4 x 1 x 1 feet) lying on its side beside a very deep well (70–80 feet and 4 feet wide). This would be extremely difficult to salvage for a museum because of its weight and the distance it would have to be dragged to a vehicle. Mrs. Field took a photograph (fig. 80).

Other carved sections of pillars and door lintels lie partly buried beside a narrow, sloping path. Excavations in this area would yield some good examples of this craftmanship.

We were led by the Headman and 5 men to the abandoned Hindu section. Here were many houses with elaborate carved wooden exteriors and painted walls and ceilings. The narrow streets (6–8 feet) had 2-story houses on each side.

We climbed around for an hour and collected some pottery, all relatively recent, although some were painted with black lines, zigzags, etc.

When we returned to the Jeep, we examined a series of manuscripts produced by the Headman. Mohammed Idris Saddiqi expressed great interest in these texts, which might throw light on the history of Fort Marot (*see* Appendix D). Since these manuscripts were folded so that many were torn, they were photographed by Mrs. Field by being held flat against the inside of the Jeep's windshield, there being no glass sheet in the Fort.

The men and children at Fort Marot gave the impression of being of East Indian types. The hair and eyes were uniformly dark brown. The skin color was lighter than that of the Baluchis and Brahuis of Baluchistan. The children showed a wide range in head form, there being dolichocephals, mesocephals and brachycephals. There appeared to be 2 racial types present: a dolichocephalic element with a long, oval face and convex nose; and a brachycephalic group with a short, broad face and straight nose. The former element seemed to be in the majority, although these observations were based on only about 20 men in Fort Marot.

Search through the historical records in Bahawalpur revealed that on a brick at the entrance to Marot is an inscription in Hindi, which runs; "Sambat 1548 Birkhi Poh Sudi 2, Marot patha Malik Jam Sumra kot Paki khel phirai." This shows that it was once in possession of Jam Sumra, who repaired it in A.D. 1491.

Inside the Fort stands the mosque of Shah-i-Mardan and on a stone in the wall of the mosque is a Persian inscription, translated as follows:

> This mosque was erected in the reign of Jalal-ud-Din Muhammad Akbar by Muhammad Tahir, the ruler, at the instance of *Sayyid* Nasrullah, in the month of Zilhijj 976 H.

Possibly the founder of Marot was Mahrut, the ruler of Chittor, who fought with Chach, the usurper. It lay on the ancient road from Multan to Delhi via Sarsuti (Sirsa) and Hansi and thus was visited by the historian Minhaj-ud-Din in 648 A.H. It was conquered by Nawab Mubarak Khan from the Rajah of Jaisalmer in 1749. There is a story that the Commandant of Marot, having been dismissed for malpractices, petitioned Nawab Muhammad Bahawal Khan III to be reinstated in the charge, with the words, "Ya mayt ya Marot," meaning, "Either death or Marot." This attempt at a pun pleased the Nawab so much that he at once granted his request.

Masson (1842, vol. 1, p. 24) wrote:

> Marot is a town of importance, as regards its trade in grain, but of little as to its aspect. It is surrounded with mud walls of considerable extent, and strengthened by numerous towers.

According to a passage in *Muhammad Shrines* (p. 173):

> Another *shahid* of the Bubar tribe was Jamal, also called Jamaldi Shahid, buried at Marot. His tomb is visited by Kirars (Hindus) and Muhammadans who go there to present their offerings after marriage. Hindus generally distribute sugar, and Muhammadans *atta ghatta*. Besides these tombs, other Buhar *shahids* are found at Rohri near Dera Nawab Sahib. These are called the Burke Shahids and their names are Domah, Bangan, Haidar, Chaus and Miran. These martyrs were contemporaries of Sher Shah *Sayyid* Jalal, in whose time a number of Buhars and Naichs accepted Islam and as both families had long-standing feuds, Sher Shah tried to reconcile them by intermarriages. It was settled that first the Buhars should give a daughter in marriage to the Naichs. The Buhars obeyed, but the Naichs killed the Buhar bridegroom whereupon a great fight ensued in which 22 Buhar chiefs were killed; amongst these were the five *shahids* whose names to the present time are commemorated by their tribe. Vows are made to their tombs, especially by Buhars.

We left Fort Marot at 1730 hours, with Mile 210 on the speedometer. Mrs. Field stopped to photograph a graveyard just outside the Fort. Six miles later, we turned right, or due east, near Marker No. 214. The tract followed the southern bank of a canal dead straight ahead. We continued for 9 miles along this straight road beside the canal. Two mongooses crossed the road.

At Mile 225, near Marker No. 167, we passed Rasafa (Risafa) Rest House. To the right, 2 acres of *berseem* stood out emerald green in the setting sun. The *shirin* trees on the right and the *iker* trees on the left gave total shade over the canal.

At Mile 233 we met a wedding party on the road. The bridegroom was decorated with multicolored paper strips hanging around his face. Mrs. Field photographed the bridegroom and wedding party on the way to the bride.

At Mile 235, we passed Marker No. 118 outside Quraish Rest House. For the next 10 miles, we continued on the well-surfaced road beside the canal. We saw another mongoose and a jackal.

At Mile 246, we turned sharp right off the canal road at the signpost to Fort Abbas.

At Mile 246.7, we halted at Fort Abbas Rest House, the time being 1840 hours.

5) *Fort Abbas to Bahawalpur Town.* On April 20 we left in the Jeep at 0545 hours to drive through the village to Fort Abbas, about two miles south. Mrs. Field took many photographs of the Fort and small mosque (figs. 82–88) standing 100 yards east of the main part of the Fort. A modern village with about 30 houses dominates a ridge 100 yards west of the Fort. We returned to Fort Abbas Rest House at 0715 hours.

An hour later, we started back through Fort Abbas village past many brick kilns, the Civil Hospital and a mosque. The speedometer read Mile 271.

As we drove through the bazaar, we saw many piles of modern pottery vessels, some of them large water jars. The track ran across small sand dunes, some of which were covered with green plants (*karri*). We left Fort Abbas about ½ mile on the right and halted outside the desert Police Post.

At Mile 274, we passed a graveyard with about 20 graves, then drove south across a small mudflat with many bushes and a few trees.

At Mile 278, we began to cross the sand and gravel bed of the Haqra River, still damp in places. Continuing to the southern side of the Wadi Haqra, we searched for chert or flint implements or flakes on alluvial patches, or low gravel banks along the southern fringe. I was unable to find any trace of flint or chert anywhere, but collected a few shells and some xerophytic plants.

We drove for an hour up and down the Wadi Haqra, along its southern edge on the Bikanir border, but could not find any trace of former human inhabitation. However, in this region southeast of Fort Abbas, the Wadi Haqra is many miles wide with no high mounds anywhere. In the rainy season the water covers a very wide area and changes the channel frequently, so that the shallow water never cuts a deep channel in this area. Without any mounds or small islands, any traces of human habitation would be washed down and harder to find than the proverbial needle. We finally gave up our search in this area and turned to the northeast.

Here the police Jeep broke down and a policeman started to walk back to Fort Abbas for two bulls to pull him back to the Police Post about 6 miles distant.

We continued northeast across mudflats and gravel patches, observing 3 gazelles dancing through the mirage. At Mile 287, we turned north to Chak 257.

At Mile 288, time 1030 hours, we drove into this village and were surprised to see a volleyball court, used by the Border Police. We were now one mile from the Bikanir frontier of India. This is the most southeasterly frontier post of Bahawalpur State.

A few minutes later we passed some modern ruins as the track led across rough country, past cultivated areas with wheat fields and lucerne.

At Mile 297, we turned south for a short distance to halt beside a single plowed furrow. This is the Bahawalpur-Bikanir border marker. We continued east for about 1,000 paces to the Police Post in Chak 241, then we drove southeast to the border pillar, a broken concrete column 6 feet high and 30 inches in diameter. We continued northeast for 5 minutes just inside the Pakistan border to a high mound (about 25 feet above the level of the plain) visible from afar. This archæological site (Site No. 13), covering about 10 acres, is strewn with quantities of plain pottery and a few rather crude painted sherds.

After a brief halt, we continued due east toward another border pillar (8 x 4 x 3 feet). This is near Chak 240, although the village was not visible from this spot. Mrs. Field photographed 5 huge vultures feasting on a carcass. We then turned north past Chak 240 with a large brick kiln amid a cultivated area. We followed a narrow, rough lane bounded by thorn fences. We passed a light-colored buffalo bull with a bright lavender spot of paint on his forehead and a ring through his nose. We halted briefly at Chak 240 to report progress to the Border Police. This was at Mile 301.

Shortly thereafter we returned to the Canal Road, again shaded by big trees. At Mile 303.8, we passed a gate and saw a sign on the left pointing to Wallar Rest House, standing amid fine trees. The time was 1210 hours. We returned to the Canal Road and shortly thereafter passed Marker No. 277. We continued along the Canal Road to Mile 316 where Kumrani Rest House stood on the left near Marker No. 221.

Continuing along the Canal Road to Mile 327, we drove left off the Canal Road into Mianwala Rest House. This was at Mile 328, the time being 1300 hours.

At Mile 335, we entered Harunabad, with the Civil Hospital and a mosque on the left and a cotton-ginning plant on the right. Here were large storehouses and granaries for wheat. In the main square there were large piles of grain and seeds. We halted to obtain some samples for the Gray Herbarium at Harvard.

From Harunabad, we continued on the hard-surfaced road toward Chistian, 31 miles ahead. At Mile 357, amid cultivated areas, we passed Dahramwala Rest House. The Sardatpur railroad station lay on the left at Mile 376. Four miles beyond we came to Baqshan Khan railroad station on the left and the village of the same name on the right across a 40-foot canal. Shortly after, we interrupted a man praying in the middle of the road with his camel tethered beside him. Nearby a single palm tree stood in the water.

At Mile 386, we passed Khankha Muntana railroad station, then Hasilpur, and shortly thereafter a silver-domed mosque in the trees on the left.

At Mile 398, we came to a signpost to Pullah and Bahawalpur. We turned left beside the huge Bahawal Canal (120 feet wide). At this point we could see, to the left about 1,000 paces through thick vegetation and across a cultivated area, the great mound of Qaimpur (Site No. 14). This is one of the most famous archæological sites in Bahawalpur.

At Mile 400, time 1700 hours, Mohammed Idris Saddiqi and I walked across to Qaimpur where we collected 3 large bags of pottery, both plain and painted ware. This mound should have trial trenches sunk into the main sections. We were told that a previous ruler of Bahawalpur believed golden treasures lay buried at Qaimpur. Large-scale unscientific digging revealed no gold but some complete vessels believed to be now in the private museum of the Nawab in his palace at Dera Nawab Sahib.

Qaimpur lies 10 miles from Khairpur, on the high road to Hasilpur and Shahr Farid, at 29° 41′ North and 72° 28′ East. Founded in 1747 by Qaim Khan Arbani, it has lost its former importance and the number of houses has greatly diminished during the past 40 years. Formerly, Qaimpur was a flourishing village.

Qaim Khan built a fine Juma mosque, which still stands, and a fort, once of great strength but now deserted and in ruins. No lineal descendant from Qaim Khan is now living at Qaimpur and his collateral descendants, who are few in number and in straitened circumsances, live by agriculture. During the time of Nawab Bahawal Khan III, many landowners lived at Qaimpur, but none are now to be found there. The municipality was constituted in 1902. The number of the members is 8 with the Tehsildar of Khairpur as President.

Leaving again at 1800 hours, we passed Qaimpur Rest House and turned sharp right toward some flat-roofed buildings with twin minarets and 2 domes of a mosque in the background. We continued through Qaimpur, a large village, to the house of *Sayyid* Abdullah Shah, where he entertained us with strong tea and cakes.

Leaving at 1855 hours, we returned through the village to the brick road and continued over a well-surfaced highway to Bahawalpur Guest House, arriving at 2130 hours.

Upon returning to Bahawalpur Town, I visited several libraries to obtain additional background information on Cholistan.

This desert area constitutes two-thirds of the State of Bahawalpur. Its main wealth is *khar,* bones, hides and skins, wool, ghee, gypsum and livestock. Due to the shortage of drinking water supply and lack of communications, its 30,000 inhabitants keep moving from one place to another in search of water.

The primary consideration of the Cholistan Development Board has been to improve the sources of drinking water supply. Seven wells have been completed and 3 reservoirs have been widened and deepened during 1954–55. Four schools and 3 dispensaries were opened and 242 miles of fair-weather roads linking important *tobas* and a few permanent habitations have also been completed in the desert.

According to Zahiruddin, Cholistan is the name given to the desert tract of Bahawalpur State; popularly, it is known as "Rohi," comprising an area of about 13,000 square miles, ranging from the cultivable lands through its length until it reaches the waters of Bikanir and Jaisalmer States in the Indian Union, forming part of the Great Indian Desert.

Cultivation is seldom possible in this tract. There is only a sparse and nomadic population of graziers to be found. This wide area consists of large tracts of grassland, interspersed with sand dunes and of flat plains of hard, impervious soil.

On the sand dunes grow bushes and stunted trees, a good diet for camels, sheep and goats, in addition to the abundant forage available on grasslands. Around catchment basins (*tobas*) a junglelike growth of trees and low bushes flourishes. This xerophytic vegetation also supplies fuel.

This region has a rainfall varying from 3–7 inches. The plains have hard, impervious soil. These are the catchment areas for the *tobas,* dug in order to preserve rain water for human and animal consumption. There are some permanent settlements where wells exist. After the *tobas* become empty, the population migrates to their respective permanent settlements, where they have a right to use the well water for themselves and for their livestock.

With very rigid rationing of water for their livestock, ranging from one drink in 24 hours to one drink in 75 hours, they eke out the water supply until March, when there is hardly sufficient for human needs. At that time the majority migrate, with their livestock, to areas near big canals and rivers, where they remain until the first rainfall. They then return to start the year's routine afresh.

During the spring grazing, large herds of camels and cattle, flocks of sheep and goats appear in prime condition. At this time, several families set up their temporary migratory homes on various sand dunes around a large *toba.*

From early morning the housewives churn the curdled milk, separating the butter and converting it into ghee. Shortly after dawn, livestock from all directions approach for their daily drink of water.

Within a short time, thousands of head of cattle surround the *toba.* Turn by turn, they drink deeply. The owners soon begin the milking of cows and camels; the former for conversion into butter, the latter mainly for food.

During the shearing season, thousands of sheep may be seen being clipped one by one.

Livestock maintained by these people consists principally of camels, cows, sheep and goats. This livestock and its products constitute their only source of income. Many buyers for their young camels (*todas*) come from the Punjab. The surplus male and female stock are also sold. Camel hair is spun and woven into beautiful woolen blankets (*falasies*) interspersed with goat-hair yarn, sometimes a mixture of black and white. Dry cows from cultivated areas are also left with these people to be grazed until calving time. In return they receive a monthly cash subsidy.

Goats are raised mainly for meat; their hair is utilized for Cottage Industries.

The principal problem in the Cholistan Desert is the provision of enough water for the human and livestock population. If solved, the number of livestock could easily be raised to 5 times the present strength.

The cattle have an admixture of various gray breeds of the Rajputana area and a very good Hariana type could easily be evolved, which could make a very good dual-purpose animal. In 1952 the total of livestock was 566,390 head; this gives about 15 acres of grazing for each animal.

Table 117. Livestock Census of Cholistan, October, 1953

Animals	*No.*
Camels	37,832
Cattle	56,772
Sheep	375,134
Goats	95,810

SUMMARY

One of the objectives of the reconnaissance in Cholistan from Fort Derawar–Fort Abbas–Qaimpur (map of Cholistan) was to confirm the range of the Indus Valley cultures along the dry bed of the Haqra River as far southeast as the Bikanir border. Our surface collections of potsherds and other objects established this cultural range.

Table 118. Archæological Sites Visited in Bahawalpur

No.	*Site*
1	Traikoa- (Trakwa or Trekoe-) Thar 4 miles north of Fort Derawar
2-3	Derawar
4	Mound 10 miles northeast of Fort Derawar
5	Sulla 12.5 miles northeast of Fort Derawar
6	Mound 14 miles northeast of Fort Derawar
7	Dunkkian
8	Turewala
9	Mahariwala
10	Lurewala
11	Kudwala
12	Bhoot
13	Southeast of Fort Abbas
14	Qaimpur

The description of the pottery by Dr. F. A. Khan in Appendix A reveals the cultural affinities not only into the central part of the Indus Valley, but as far west as Mand, near the Makran frontier with Iran.

Fortunately, we have been able to include in this Report, as Appendix B, the unpublished summary of Dr. A. Ghosh's important discoveries along the Ghaggar River in Bikanir,

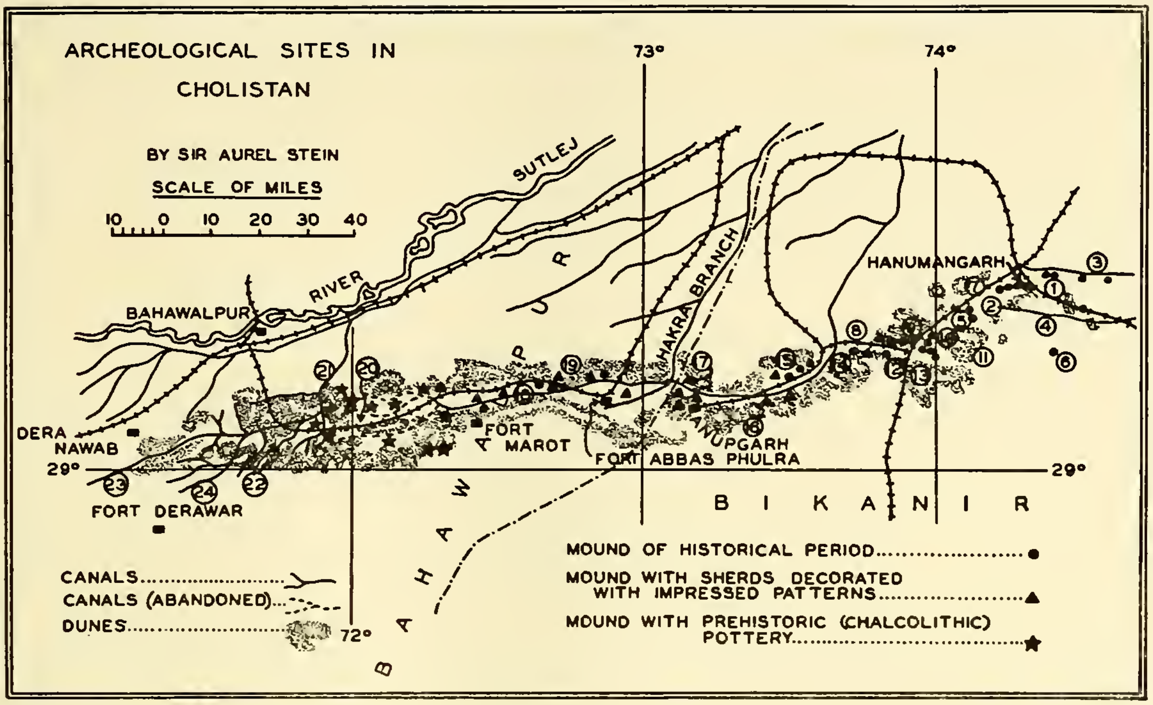

Fig. 19. Archæological sites in Cholistan (*after* Stein).

1950–51. In Bikanir, the same river bed is called the Ghaggar; in Bahawalpur, the Haqra.

From Karachi came a copy of Sir Aurel Stein's map (fig. 19) showing the sites visited by him in Bahawalpur and Bikanir. The racial types from Fort Derawar to Fort Abbas appeared to link more with India than with the Indus Valley or distant Baluchistan.

Some of the larger sites visited along the Haqra should be excavated in order to determine the chronological sequence and the cultural relationships extending from western Makran and the Quetta area to Bikanir and Jaisalmer in India.

Our reconnaissances in Baluchistan and Bahawalpur revealed cultural affinities extending almost 1,000 miles in a direct line.

Furthermore, the entire culture complex centering along the Indus Valley and ranging west onto the Iranian Plateau into Mesopotamia and along the Persian Gulf and eastward into India, must be clarified. Surface sites, including some trial trenches, have been examined. Detailed excavations must follow.

APPENDIXES A–Q

Appendix A. FRESH LIGHT ON THE ANCIENT CULTURES OF BALUCHISTAN AND BAHAWALPUR

by F. A. Khan

THE PRINCIPAL objective of Dr. Henry Field in undertaking his exploratory work in Baluchistan during March–April, 1955, was to search for traces of Stone Age cultures, to record anthropometric and ethnological data, and to establish their relationships with those of Southwestern Asia and India.

During the course of his extensive reconnaissances, Dr. Field also visited 23 protohistoric settlements in the Kej (Kech) Valley and central Makran and 11 ancient mounds in Bahawalpur, and collected a large quantity of pottery as well as a series of flint implements.

The ceramic products collected from Baluchistan sites bear close resemblances to the well-known pottery types from Shahi-Tump and Kulli and certain sites in Iran. The pottery from Bahawalpur sites shows unmistakable affinities with the black-on-red painted ware of the Indus civilization. Glazed potsherds of the Muslim period were also found from some sites in Baluchistan. The material collected by the Peabody Museum Expedition[1] is studied here.

The preliminary to any examination of the cultural relationship between Iran, Baluchistan and the Indus Valley must be an appreciation of the geographical settings. It would appear that within Iran itself there is a sharp contrast between the widespread comparatively sterile area in the center and the peripheral piedmont, although even the periphery is in places interrupted by desert areas as in Baluchistan. The main lines of communication, therefore, tended to follow the outer circuit of the country, and to penetrate abroad through different mountain passes wherever these were to be found. The large urban centers could only arise in places where sufficient water was available. Through these large centers the main lines of traffic inevitably passed, and many of the Iranian sites attracted trade with the outside world, as far as the Indus Valley on the one hand, and the Tigris-Euphrates Valley on the other. A detailed study of both the larger and smaller centers at which ancient remains are known to exist is now available and the main arteries of the ancient traffic through these centers can be clearly discerned.

However, where ancient sources are deficient, we may often obtain guidance from the descriptions of well-known cities and settlements in the works of medieval geographers and historians. The later cities are often to be found on the lines of more ancient highways and it is frequently legitimate to draw inferences from them as to the distribution of much older prehistoric routes. Possible climatic changes may have been responsible for the decay and disintegration of ancient cities in Iran, in Baluchistan, and in the Indus Valley, but the main thoroughfare between these regions has been perennially used.

Throughout the Iranian Plateau a system of caravan routes links the different provinces. In the north the main line of communication is the west–east highway across the Iranian Plateau and along the Elburz Range to Merv and Herat. No less important is the southern route, which connects Susiana and the Bampur Valley extending to Shahi-Tump and Kulli in Baluchistan and Mohenjo-daro in the Indus Valley.

It was along this line of communication that in antiquity the early emigrants from Iran entered Baluchistan. The long chain of ancient sites lying along this line of communication attests to a state of favorable trading conditions for this region. From Susa along this highway the province of Fars was reached. Here the ceramic products of Tell-i-Bakun show some features of resemblance to the "Quetta ware."

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[1] Mohammed Idris Siddiqi of the Department of Archæology, Pakistan, accompanied Dr. Henry Field on his explorations in Baluchistan and Bahawalpur. *Hajji* Abdus Salam, draftsman of the Department, prepared the colored and line drawings of pottery and other objects. In order to have line cuts made Mrs. Helen Lyman redrew the colored drawings of pottery. For special references *see* Fairservis 1956b with bibliography.

The early culture of the Bampur Valley sites in southeast Iran also shows unmistakable affinities with the cultures of Shahi-Tump and Kulli. The notable feature is the painted pottery, red and buff, with designs such as humped bulls, tiny horned goats and plants with broad leaves. These decorative elements confirm the relation with a similar stage of ware appearing at the Kulli culture sites, and at Karchat, Shahjo-Kotiro and Chanhu-daro in the Indus Valley.

This technique seems to have originated in Sialk III–5 and Hissar I C and to have developed at Nineveh during the Jemdet Nasr Period. At a later date these characteristic features were carried to the East to leave their influence from Kerman to Seistan, Makran, Baluchistan and the Indus Valley. Thus, we are dealing with a main route which in antiquity linked southwest and southeast Iran with former British Baluchistan and the Indus Valley.

BALUCHISTAN

Kej Valley. An exception to the widespread desolation of Makran is found in the valleys of the interior, namely Kej and Panjgur, where crops and date groves afford a pleasant scene. The major river of these fertile regions is the Dasht. Its western branch rises in the highlands of Bampusht, where it bears the name Nihing. After passing the escarpment of the main plateau, it turns eastward through the fertile valleys of Mand and Tump, and at Kej joins its waters with those of its eastern affluent. This affluent, the Kej (Kech), flows due west through the long valley lying at the foot of the upland ridge which forms a natural highway between Iran and the Indus Valley. A previous survey undertaken by Sir Aurel Stein (1931) from the Iranian border to Turbat in this valley brought to light a number of ancient sites along the highway and most of them definitely help to establish connections between Iran, Baluchistan and the Indus Valley in antiquity.

Mand-Turbat. East of Mand village, which lies on the highway, is Kalat-Damb and further east is the site of Shahi-Tump. At these sites, among the potsherds, a large number were found painted with black geometric designs consisting of zigzags and triangles. East of Shahi-Tump is the site of Nazrabad. The pottery of this site in form and decoration resembles closely the pottery of Periano Ghundai in northern Baluchistan; it has a darkish terra cotta slip and ornamentation with geometric designs in black.

Cairns. Some miles northwest of Nasirabad village on the highway there are a number of burial cairns. These have yielded fragments of human bones and coarse red pottery. With the help of these finds, it has been possible to identify the burial customs here with those at Moghul Ghundai. Other sites in the Kej Valley, Balor, Gushanak and Jaren, mentioned by Miss Beatrice de Cardi (1951), have produced a painted pottery known as the Londo ware related to the pottery of Sialk Cemetery B.

Near Turbat a number of ancient sites are conspicuous and of great importance. At Shahi-Tump was discovered a cemetery which contained bodies lying in a flexed position and accompanied by grave furniture consisting of pottery, copper and bronze tools and other objects. The grave pottery is of great significance, as similar pottery occurs at Khurab near Bampur in southeast Iran. It seems to be contemporary with Kulli culture. There are also similarities with the ware from Susa A in southwest Iran.

Turbat-Pasni. From Turbat a route leads lower down along the left bank of the Dasht River and connects Turbat with the seaport of Pasni. It passes through a low and broken chain of hills to the south of the Kej Valley.

Turbat–Hoshab–Panjgur–Nag-i-Kalat–Surab–Quetta. Going from Turbat eastward, the highway passing through the Kej Valley comes to Hoshab, where there is a bifurcation of roads. The one proceeding northward crosses the central Makran Range and reaches Panjgur and from there running in a northeasterly direction via Nag-i-Kalat comes to Surab. From Surab, the route passes through Kalat and Mastung to Quetta.

Panjgur Valley. In the vicinity of Hoshab and Panjgur a number of ancient sites have been found. On some sites near Panjgur Medieval Period glazed pottery has also been found and the reason for the growth of ancient and medieval settlements must have been primarily due to the commercial prosperity of Panjgur itself. Favorably situated on the route from Iran to the lower basin of the Indus, it may well have attracted in antiquity and historic times the establishment of a number of smaller communities in its vicinity.

Baluchistan Pottery and its Analogues. The assemblage of pottery and other minor objects collected from 23 sites situated in the Kej Valley and central Makran in Baluchistan consisting of important specimens fall into two main groups known from the area: (*a*) the Shahi-Tump; and (*b*) the Kulli-Mehi. The general characteristics of these two groups of pottery are examined here.

Group I (*Shahi-Tump Type*). The main characteristic is its uniformity. Traditional convention must be held to account for the persistent uniformity of this pottery in respect of paste, technique, shape and ornamentation. That all the vessels were made for non-domestic use only, is proved by their thin, fragile and imperfect fabric, obviously due to inadequate levigation and firing. The color of the pottery is pale red and gray. As regards the uniformity, all the more notable is the repetition of the same scheme of decoration as applied to a particular type of vessel. The limited range of geometric patterns and their limitation to particular shapes, differentiates this pottery from the painted household pottery. Noteworthy parallels are found with the painted pottery of Susa A. The paint used varies from black through sepia to a reddish-brown. Its characteristic feature is the soft blurred edge of the outline. The interior ornamentation, where this occurs, consists of quatrefoil designs. Some of the forms resemble closely the Iranian pottery from Khurab which is contemporary with Kulli.

Group II (*Kulli-Mehi Type*). The second group of pottery is divided into two distinct types based upon the style of decoration: (*a*) with purely geometric elements; and (*b*) on which geometric designs are combined with stylized animals and plant forms.

It may be inferred from the introduction of plant and animal decoration that the second type of pottery of this group developed out of the first. The first type has only geometric motifs like the Amri ware; and the second type has geometric as well as animal designs like the pottery of Nal. The second style of decoration is also found on the Harappa culture ware, especially the "pipal" motif. It may then be inferred that the Harappa culture pottery is contemporary at some stage with the pottery of the Kulli culture.

The second group of pottery is characterized by the fine quality of the painted vessels. The designs are executed in black over a pinkish or buff ground. However, in addition we find a dark red color having been used for painting the horizontal bands which divide the zones of decoration. The ornamental devices are of a varied character. Besides the geometric elements, there are frequently found representations of humped bulls, miniature horned goats and plant forms. The humped bull is portrayed with an elongated body. The long, curved horns, powerful muzzle and large round eyes are depicted in a naturalistic style. The small-horned goats show a stylized form.

The paste of the pottery is pinkish or buff. There is a pale red or sometimes whitish slip, on which is painted black ornamentation. Sometimes secondary red color is used for painting the horizontal bands. This style of decoration resembles that of the "Scarlet ware" of Mesopotamia and Susa D. The technique of painting the bulls' eyes with a black round spot inside the eye circle as found on some potsherds, bears a close similarity to the bulls' eye design depicted on Susa D ware. The crowded lines of miniature goats occurring side by side with the bull figures have close parallels on the pottery specimens from Bampur in southeast Iran. These compact rows of little animals appear to have originated in Iran, as we can trace them on all the important sites of that country.

A more or less detailed examination of the individual collections from Baluchistan sites visited by the Expedition in comparison with the above two known groups of pottery is possible.

Baluchistan Sites. 1) Shahi-Tump (fig. 20, 1–4). The general description of the first group of pottery given above holds good for the pottery collection from Shahi-Tump. The potsherds are of the usual thin and fragile variety of pink and gray with rough and crude decoration. There is only one fragment of buff ware with the same style of decoration. The common motif is a zigzag pattern of thick lines executed in free-hand style (fig. 20, 1). More definable motifs include rows of chevrons and crosshatched triangles (fig. 20, 2). The other unidentifiable patterns of the same rough brushwork are done in zones and panels. The inside ornamentation, mostly on gray ware, consists of rough vertical strokes on rims (fig. 20, 1) and the quatrefoil designs (fig. 20, 3). The paint varies from black to reddish-brown through sepia. Fragments of two large jars bear zigzag black decoration. Other forms include cups, saucers, bowls and narrow-mouthed vases. There are also pieces of three tiny gray pots.

Some heavy-textured pottery is different from the above-mentioned types. The fragments bear crude stamped designs imperfectly executed and rough relief lines. A fragmentary round bowl with a perforated ring for suspension is of interest (fig. 20, 4). It is difficult to say what relationship this pottery has with the above-mentioned type in the absence of stratigraphical evidence.

2) *Tump.* From this site comes a small collection of pottery consisting of a few fragments of thick and rough fabric. There is a perforation on the rim of a neck piece, which was meant for suspension. On another potsherd there is trace of interior decoration in thick red lines on pale red ground. One small piece shows traces of fine decoration. This piece appears to represent a large storage jar. In the absence of other details, it is difficult to establish the identity of pottery from this site with the pottery of any other culture.

3) *Fort Miri (fig. 20, 5–8).* A part of the pottery collection from Fort Miri site near Turbat is also of the Shahi-Tump type with the thin pinkish and gray varieties. The decoration in black to sepia and brown is also of the same rough brushwork (fig. 20, 5). The few potsherds are in too fragmentary a condition to obtain a proper idea about the forms and decoration, but thick lines forming indeterminable patterns in zones and panels as well as crosshatched triangles are traceable.

Some of the potsherds have dark brown paint on the interior of the rim in thick bands (fig. 20, 6), and also on the outside. This dark brown or dark paint on thin pink and gray pottery from many sites of Baluchistan is an interesting common feature. Some potsherds of finer texture and with thin brush decoration in black and red belong to the Kulli-Mehi pottery group (fig. 20, 7).

There are two other varieties of pottery in this collection: (*a*) characterized by its heavy texture and crude incised decoration which consists of dots, concentric circles, wavy lines (fig. 20, 8) and horizontal bands in relief; and (*b*) the blue- and green-glazed pottery. Both these types appear to belong to the Medieval Period; also belonging to these later types of pottery is a fragmentary terra cotta hand mill with a roughly incised surface.

4) *Nodiz.* From here also comes a small collection consisting of the heavy-textured red pottery of Nasirabad and Shahi-Tump type. One light gray sherd, however, is of somewhat finer fabric with deeply incised horizontal and slanting lines. In form crude open bowls are recognizable. There are a few pieces of blue-glazed ware of the Medieval Period.

5) *Kalat-Damb.* The pottery consists of only seven sherds of the Nasirabad pottery style. The texture is of coarse and rough type with incised decoration. The only painted piece has a crude grid pattern in dark red paint on the interior. The minor finds include a piece of medium-thin open bowl and a fragment of a terra cotta disc with incised dots and vertical lines.

6) *Nazrabad (fig. 21, 1–2).* This pottery is also of Shahi-Tump type, both pink and gray, with zigzags and other patterns in zones and quatrefoil designs in the interior executed in freehand style (fig. 21, 1–2).

There are also some sherds of the heavy-textured, crude red pottery with imperfect relief or stamped decoration. The collection contains 3 small pieces of green-glazed pottery of the Muslim Period. The small finds include a fragmentary terra cotta circular cakelike object with incised dots, and some pieces of worked stone.

7) *Nasirabad.* A small collection of rough heavy-textured red pottery with a gray sherd of the same fabric is characterized by its coarse roughness and inadequate levigation, made probably for rough use. There are on it crude incised patterns as well as simple painted designs of horizontal lines in black, and interior decoration in dark red. The collection contains a fragmentary terra cotta hand mill. One blue-glazed potsherd of the Muslim Period has also been collected.

8) *Thale-Damb* (*Hoshab Mound A*). The pottery consists of red household ware of inferior quality, mostly medium-thin in texture with a few rough heavy pieces. Some of them have simple incised decoration of wavy lines and crisscross patterns of relief ribs or wavy lines. Painted designs are limited to simple horizontal bands, wavy lines or loops.

This pottery is apparently different from either Shahi-Tump or Kulli-Mehi types, and appears to some extent similar to the third type of red ware from Sraduk site. But there are a few small pieces of thin pottery with faded designs of horizontal and vertical lines. However, the sherds are so fragmentary that it is difficult to determine if they belong to the Shahi-Tump type. There are traces of dark brown paint on some sunburnt fragments.

9) *Thale-Damb* (*Hoshab Mound B*). The pottery collection contains a few pieces of thin gray and pink sherds of Shahi-Tump type with traces of the characteristic painting in thick lines done in a carefree style. There are 3 red pieces of rough, heavy-textured pottery and a few fragments of shell.

10) *Surain-Damb* (*fig. 21, 3–5*). This collection from the "red" mound appears to have pottery of Shahi-Tump and Kulli-Mehi types. The first type consists of the thick gray ware with bold black decoration (fig. 21, 3) and pink ware with freehand style painting on both sides (fig. 21, 4). However, in texture it is finer.

The other type is the fine black-on-red variety of Ander-Damb type with the common stylized horn motif and other geometric patterns. In texture and decoration it can be related to the Amri-Kulli varieties, but there is no animal design. Solid rectangles in horizontal rows, crosshatched square panels and small panels of vertical lines between horizontal bands are also common (fig. 21, 5).

Dark brown paint over the whole body or over part of it in thick bands also has been used. The pieces represent mostly open dishes, bowls and vases. The heavy-textured, coarse pottery pieces include storage jars. The blue-glazed pottery specimens belong to medieval times.

11) *Khona-Kalat* (*fig. 21, 6–8*). The pottery collection from this Old Fort is very small, consisting of a few potsherds and a square copper seal. Almost all the pieces except two are insignificant fragments of heavy and crude vessels. Of these two pieces, one is a small fragment of a thin gray straight-sided small pot painted black on the interior (fig. 21, 6). The other, almost a complete small bowl (fig. 21, 7), is very interesting and appears in shape, texture and other details to be of Shahi-Tump type. Its surface both on the interior and exterior is very much decayed, and so it is difficult to say if there was any decoration, but traces of dark brown paint over the pale red body is clear. This tiny bowl is fragile, thin and imperfectly shaped. It is made of inadequately levigated clay which is not well fired.

But the most important object in the collection is the copper seal (fig. 21, 8), and as such some discussion on it is necessary.

11 A) *Compartmented Copper Seal.* This object, which was collected from the surface of Khona-Kalat site, is square with a pierced knob at the back, measuring $1\frac{9}{16} \times 1\frac{9}{16} \times \frac{13}{16}$ inches. It is decorated with stepped patterns forming four compartments.[2]

It seems to have a common origin with the copper seals of Shahi-Tump and Hissar II and III in Iran. The Shahi-Tump specimens are circular with the face divided into 4 compartments, bearing a simple pattern of curved concentric arcs. In Iran this type appears to have an interesting distribution both in space and in time. At Hissar the first stamp seals made of copper appear in Period II B. They are of two types: (*a*) with a circular base depicting a cut-cross design; and (*b*) with a scalloped face, ornamented with filled crosses. Both types have a pierced handle at the back.

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[2] A compartmented seal is, as a rule, circular or square with a simple pattern on the face built up in compartments by projecting strips of metal.

The characteristic seals of Hissar III B, are also made of copper. These are circular in form with a perforated knob. The seals portray deeply cut geometric patterns and some figures which are difficult to identify. All these seals are in the compartmented technique and are paralleled with one from Anau III in Soviet Turkestan.

12) *Besham-Damb.* This pottery consists mostly of plain heavy-textured ware of pinkish variety with crude incised and relief decoration. Few pieces have simple painted designs of broad bands and horizontal lines in black. Some of the pieces are of ribbed ware. Sherds of thin pink and gray ware are very few and fragmentary in condition. However, two types resembling the Shahi-Tump and Kulli-Mehi pottery are recognizable. The Shahi-Tump type includes both gray and pinkish varieties with the usual freehand style of painting. The Kulli type is represented by sherds with the geometric patterns painted inside. In shape they consist of open dishes, bowls and jars.

13) *Sraduk* (*fig. 22, 1–8*). The pottery from this site is interesting, consisting of both the Shahi-Tump and the finer Kulli-Mehi types (fig. 22, 1–3). The first type has the usual thin pink and gray varieties, although the pink ware of this site has slightly heavier fabric. However, the characteristic freehand decorative style in thick lines is common (fig. 22, 1). The devices include zigzags, stepped designs, and a variety of geometric patterns in panels and zones. The gray pottery also has interior decoration.

The other type is characterized by the finer fabric and more developed and elaborate decorative style. In texture it is also thin, the clay is well levigated and well fired. Of the painted designs, the most characteristic specimen of the type is a sherd with the row of small-horned goats in stylized horns like upcurving hooks (fig. 22, 4), the "pipal" leaf and a pair of deer in naturalistic style, sigmas in horizontal and vertical rows, a tracerylike design done in double lines all over the body which has close parallels in Nal pottery (fig. 22, 5) and a variety of geometric patterns made by a combination of vertical and horizontal thick lines.

A common characteristic peculiar to both these types of pottery is the dark brown paint usually occurring on the interior of the saucers, open bowls, dishes, etc., as a thick band at the rim or over the whole of the exterior or interior of the vessel. This decoration occurs on both pink and gray varieties (fig. 22, 6). In form most of the fragments represent cups, saucers, open bowls and dishes, flat-bottom pans, jars and vases.

There are some rough and medium-thick textured pottery sherds in the collection with incised (fig. 22, 7) and ribbed decoration (fig. 22, 8) as well as simple painted designs, such as horizontal bands, loops and wavy lines. Incised decoration includes nicks, wavy and grid patterns. The nick designs occur on the center of the inside of the vessels and may have some relationship with the similar decorative style of the Indus civilization pottery. There is a small piece of heavy perforated ware.

There are also a few pieces of blue- and green-glazed ware of the Medieval Period; a piece of a small bowl of banded agate; a fragment of a bronze rod; and some geological specimens of the area.

14) *Damb-i-Dambi* (*fig. 23, 1–5*). This pottery collection is also of the Kulli-Mehi type. However, except for one sherd, there is no buff specimen. All sherds are of the pink variety. In texture it is slightly heavier and coarse. Most of the pieces are decorated with black designs. The common designs include hatched garland patterns, horizontal bands, rows of stylized goats with long and beautifully back-turned horns (fig. 23, 1), and plant motifs in naturalistic form (fig. 23, 2). Some of the geometric patterns are of especial interest.

A few of the coarser plain sherds have incised and impressed circular swirl designs (fig. 23, 3). These and the plant motifs seem to bear resemblance to the decorative motifs of the Indus Valley pottery. One of the painted designs also looks like the Harappan intersecting circle pattern (fig. 23, 4). The forms are represented by vases, open bowls, dishes, storage jars and round pots. The open dishes and bowls have interior decoration (fig. 23, 5). The minor objects include some terra cotta humped bulls, gaming discs and a piece of perforated ware.

15) *Chiri-Damb* (*fig. 23, 6–11 and fig. 24, 1–3*). The pottery resembles that of Dambi site almost in every detail, except that some of the pieces are of finer texture. Stylized animals are also found (fig. 23, 6).

Here also the entire collection is of the pink variety of Kulli-Mehi type. The motifs consist of hachured garlands (fig. 23, 7), "pipal" leaf (fig. 23, 8), wavy lines with horizontal bands (fig. 23, 9) and circles with dots round the neck, executed in black in the same overcrowded manner as on Kulli pottery (fig. 23, 10). Dark red bands to divide panels occur on some pieces. Sigmas, hatched triangles and other complex geometric designs are numerous. The incised nicks occur inside some pieces. In shape also the sherds resemble the Dambi pottery. There are open dishes and bowls, storage jars and narrow-mouthed round pots, vases and goblets. There are also a few sherds of gray pottery. A pink fragment with white slip, wide brown band and high relief fine wavy decoration is of great interest (fig. 24, 1).

The most important objects of the collection, however, are the terra cotta humped bulls of very fine workmanship. In shape they resemble the painted bull representations of Kulli-Mehi pottery with a slightly elongated body, powerful muzzle, long curved horns and graceful hump (fig. 23, 11). The heavier sherds decorated outside with incised designs and ribbing may be assigned to the Muslim Period (fig. 24, 2–3).

16) *Sari-Damb* (*fig. 24, 4–6*). Like the pottery from Sraduk, this collection also has a mixture of Shahi-Tump and Kulli-Mehi types. The former type is represented by the few thin gray sherds with the characteristic freehand style decoration of thick lines (fig. 24, 4). The pink variety is very rare and has heavier fabric; it is not so thin and fragile as the Shahi-Tump pottery. In decoration also it is slightly different, consisting of crowded horizontal lines with a panel of loops covering the whole exterior body (fig. 24, 5). Some of these pieces have intricate motifs of loops, river pattern, rows of triangles, rectangles, zigzags, etc., executed between a pair of those crowded parallel lines as well as some panels filled by a combination of horizontal and vertical lines which form certain geometric patterns. These are nearer to Kulli-Mehi type rather than Shahi-Tump in artistic perfection.

The second type is larger in number and typical in decorative style. There are a few characteristic geometric patterns, painted in black or sepia, on red ground, and occasionally over a buff slip, the most common and interesting being a sort of tracery or interlaced design done all over the body in fine outlines of thick lines (fig. 24, 6), which has close parallels in the painted pottery of Nal. Rows of crosshatched parallelograms, crosshatched panels and other geometric patterns of horizontal and vertical lines in combination are also worth mentioning.

The second type of pottery is very fine in texture. A very common feature of the plain, as well as the painted ware, is the brown to dark brown and occasionally dark red paint done on the rim or neck as thick bands or over the whole interior or exterior of the vessel. Sometimes two different paints are used for exterior and interior painting. Very often parallel wavy lines in thin relief decorate the vessels below the neck or around the middle of the pot.

In form the pottery pieces represent mostly open bowls, cups, saucers and vases. There are a few heavy-textured pottery pieces with occasional relief or incised decoration. Minor finds include a terra cotta gaming disc and a marble fragment.

17) *Zayak* (*fig. 24, 7*). The pottery collection consists roughly of two types: (*a*) fine pink ware variety resembling in texture and decoration the Kulli-Mehi ware; and (*b*) a coarse red ware with incised and relief ornamentation.

The first type includes pieces with dark red, buff or light gray slip or wash over which are executed geometric patterns or horizontal bands in black or dark brown paint. Some of the plain pottery pieces of this type have dark brown or deep red paint, in some specimens over a part only in thick bands, otherwise over the whole body of the pot, interior or exterior.

There is one sherd with a trace of faded painting in black over a whitish gray or fawn slip. Two other pieces with geometric and loop patterns painted in black or dark brown are interesting, recalling similar specimens of Nal pottery. One polychrome piece with black-lined and filled geometric designs and dark red panels over a buff slip is worth mentioning (fig. 24, 7).

The other type is coarser and more crude in texture and decoration. It consists of ribbed ware with both relief ribs and a sort of impressed over-all design of rough ribs. Other designs include string ornament in relief and incised lines, as well as simple painted designs of wavy and horizontal lines. In form the thin pieces represent open cups and bowls, and the heavy specimens appear to belong to storage jars. This type of pottery indicates that the settlement of Zayak continued to be occupied into historical times.

18) *Jangal* (*fig. 24, 8–9*). The collection from a mound near Jangal consists mainly of heavy-textured coarse pottery, and a few pieces of thin painted ware. The heavy specimens have relief and impressed decoration in the form of strings and bands. Some of the pots have knobs or handles.

The thin painted ware is of the pink variety, but the pieces are so fragmentary and faded that the designs are not very clear. Stylized flying birds and wide bands in brown paint occur on one sherd (fig. 24, 8). The painting is done in rough style. Other objects include a terra cotta circular jar-stopper (fig. 24, 9), a piece of perforated ware and a rounded stone piece.

19) *Shakar Khwan-Damb* (*fig. 25, 1*). This pottery also resembles the fine Kulli-Mehi type with geometric patterns, executed in black on pale red and buff slip. This fine thin pinkish pottery is painted with black designs. Some of the specimens have dark brown paint over the whole body or thick bands near the neck. Designs include solid or crosshatched rectangles in horizontal rows, the characteristic tracery or interlaced design (fig. 25, 1), loops, wavy thin bands and a variety of geometric patterns. The thicker pieces have simple incised and relief decoration. In shape this pottery is represented by bowls and cups, large jars, straight-sided pans. Among minor objects are two terra cotta gaming discs.

20) *Ander-Damb* (*fig. 25, 2–10*). The pottery collection is very important. It represents the typical Kulli-Mehi type both in texture and decoration. Even a superficial examination is convincing of the close relationship between the ceramic products of these two sites.

In color two types are distinguishable: (*a*) a fine red or pinkish variety, with deep or pale red slip; and (*b*) a buff variety over which a buff or whitish slip is applied. Black and dark brown ornamentation is executed over the slip. Sometimes a secondary red color is also used. This is illustrated by a small piece on which the inner surface of motifs is painted red, while the outline is in black (fig. 25, 2). On some of the coarser vessels dark brown paint is applied either over the whole of the exterior body or on part of it as wide bands. Except for these few pieces all others are of painted ware. These coarse ware examples have simple relief decoration of ribs and wavy lines as well as fine incised lines and wavy patterns (fig. 25, 3).

The painted pottery, like the Kulli-Mehi type, is characterized by its fine quality. The designs in black or dark brown are painted on fine pinkish or buff ground.

In decorative style two distinct types are also recognizable: (*a*) with geometric elements like those of Amri ware (fig. 25, 4–6); and (*b*) with a combination of geometric patterns and stylized animal forms, like those of Nal pottery. The ornamental devices of the first type are of a varied character; particular mention may be made of rows of hatched rectangles, sigmas and chevrons. Of the second type the most noteworthy specimens are the representations of humped bulls, which occur very frequently (fig. 25, 7–8). A long-horned goat with hatched body in black and red in naturalistic style (fig. 25, 9) and a fragmentary piece with stylized creatures of unrecognizable character (fig. 25, 10) have also been found. But no specimen of the stylized small goats has been found in the collection. The humped bull has the characteristic elongated body, long-curved horns, powerful muzzle and large round eyes. This style of decoration resembles, as stated before, that of the "Scarlet ware" of Susa D in Iran. The forms include open dishes, bowls, saucers, vases, narrow-mouthed pots and jars.

21) *Ghuram* (*Benn Chah*) (*fig. 26, 1–5*).

Pottery from Ghuram, although resembling to some extent Shahi-Tump types in texture and decoration, has some peculiarities of its own. In texture it is mostly thin to medium-thin, imperfectly levigated and fired, but not so fragile. In decoration the same careless free-hand brush work is traceable, although the designs are somewhat different. The painted gray variety of Shahi-Tump is conspicuous by its absence. In color this pottery is generally pink, but a few sherds have a greenish-gray color. The most noticeable characteristics are the use of different colored slips or paints all over the body or in wide bands, as a decorative style. Slips used are usually of buff or light red, but the most characteristic feature is the bands in light red (fig. 26, 1), deep red and dark brown painted over the slip covering the body or one part of it. Simple designs in black or dark brown are also executed over the slip. They consist of crosshatched rectangles in a row (fig. 26, 2), part of panels filled up by vertical lines and part divided crosswise by wavy lines (fig. 26, 3), and broad patterns made by filling up areas in panels with paint. There is one sherd with a stylized horn design (fig. 26, 4). Some pieces have simple rib relief decoration (fig. 26, 5); these indicate that occupation is of medieval times.

The recognizable forms include small open dishes, bowls, cups, narrow-mouthed pots and jars. Minor finds include a stone pendant, one barrel-shaped stone bead and a fragment of a banded agate bowl.

22) *Kapoto (fig. 26, 6–9 and fig. 27, 1–6).* From a mound midway between Little and Big Kapoto comes a collection of very fine pottery of the Kulli-Mehi type that resembles Ander-Damb in texture and also decoration. However, instead of the usual pink and buff varieties, it also consists of two other types: the gray and the greenish-gray. The pink-and-buff varieties have similar deep red or pale red and buff slip, and over them have almost the same designs except the representation of animals which is missing here. However, stylized horns are found on some pieces (fig. 26, 6). The use of a secondary red paint has also not been found. Loops (fig. 26, 7), crosshatched rectangles in horizontal rows (fig. 26, 8), zigzags (fig. 26, 9) and a number of geometric patterns made of horizontal and vertical lines (fig. 27, 1) are mentionable. Designs are executed in black, dark brown or chocolate. However, the most characteristic feature of this pottery is the use of wide bands (fig. 27, 2–4) and wash of different colors, red, light red, black, dark brown, brown, chocolate, buff and light gray. The effect is quite pleasing. Some of the shapes are perfect and elegant. In general, the pieces represent open bowls, dishes, goblets, cups, saucers and jars. Some of the pieces have fine relief (fig. 27, 5) or incised decoration of lines or simple patterns (fig. 27, 6).

23) *Kapoto Rock Shelter (fig. 27, 7–8).* The pottery collection from the upper levels of this site consisting of a very few pieces of insignificant character appears to be of the same class of Kapoto pottery. There are pink fragments and one piece of greenish-gray with a wide band of dark brown (fig. 27, 7). A few pieces have incised decoration (fig. 27, 8) as well as horizontal lines in relief.

BAHAWALPUR

The archæological map of West Pakistan shows how the vast unexplored area of Upper Sind, Khairpur, Bahawalpur and southern Punjab intervenes between Harappa and Mohenjo-daro—an area which should yield a large number of intermediate stations strung out along the route which, in antiquity, connected these two principal cities of the Indus civilization.

Sir Aurel Stein, in order to trace the ancient settlements of this civilization in Bahawalpur, did some exploration work and brought to light a chain of closely situated sites.[3]

The object of Dr. Henry Field in visiting

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[3] During 1942 Stein visited the undermentioned sites in Bahawalpur State, but unfortunately no report of his studies is available: (1) Ahmadwala, (2) Allahdino, (3) Chabbuwala, (4) Charaiwala, (5) Daiwala, (6) Fort Derawar, (7) Garakawali, (8) Jalhar, (9) Khanpuri-Thar, (10) Kudwala, (11) Mitha Deheno, (12) Skikhri, (13) Traikoa-Thar. (F.A.K.) Since this was written I have placed part of Sir Aurel Stein's notes on these sites on Microfilm No. 4861 in the American Documentation Institute, % Photoduplication Service, Library of Congress. (H.F.).

Bahawalpur after his field work in Baluchistan was also to trace the Harappa culture settlements in the Cholistan region, with which the neighboring Bharati States of Bikanir and Jaisalmer form a contiguous part, and where recently the Archæological Survey of India discovered a number of sites of the Indus civilization (*see* Appendix C).

In the short period of one week the Peabody Museum Expedition achieved excellent results. From 11 sites were collected a large quantity of pottery and other objects, which are exactly analogous with the ceramic products and other material from the sites of Harappa and Mohenjo-daro.

The pottery, both plain and painted, is of excellent quality. Its highly specialized character is demonstrated by the decoration of the red ware. This attests to an artistic and sophisticated style. The designs are executed over the red slip in a black paint. The decoration is either over the whole surface of a vessel, or part of it, in zones and panels. The designs consist of geometric devices as well as stylized human, animal and bird forms and vegetation. The common patterns include hatched designs, zigzags, wavy lines and triangles. Incised and stamped pottery is fairly common. The patterns, which mostly consist of deeply impressed concentric circles and incised wavy lines, occur on the inner flat surface of deep tublike large vessels. In this case the patterns must have had a utilitarian rather than a decorative purpose, for it is assumed that these tubs were used for bathing small children, and this deep impressed decoration helped them from slipping on the inner surface of the vessels.

The pottery shows a highly developed technique as is evident from the varied shapes. The principal forms include storage jars, offering-stands, goblets, beakers, narrow bowls, dishes, basins, pans, jar covers, perforated ware, handled cups, saucers, cooking pots and water jars.

The pottery collected from various sites of Bahawalpur does not differ in form and mode of ornamental devices and only in a few instances would it be possible to say with certainty in which of the sites a particular vessel was found. This pottery and other material accordingly represents a highly specialized product of a single sophisticated culture of long duration, although it has not been derived from a stratum in excavation. All the sites visited by Stein and Field obviously call for detailed investigation. As will be seen in the ensuing discussion of the pottery, it forms a uniform group with well-marked links with the black-on-red ware of the Indus civilization.

1) *Kudwala* (*fig. 28, 1–7*). This pottery collection consists of 3 types. The first 2 types have clear resemblances to the 2 types of pottery from Dunkkian: (*a*) plain ware with soapy surface; and (*b*) with rough relief decoration. The third type has affinities with the Harappa culture pottery. In decoration, however, there are some elaborate painted and incised designs, such as rows of suspended leaves separated by a wavy band, multiple loops, and hatched leaves and the incised spiral design (fig. 28, 1–3).

In form the pottery includes large storage jars painted with wide black bands and with a prominent external ledge for resting the lid (fig. 28, 4), narrow pointed or heavy bases of jars, vases, heavy-based goblets (fig. 28, 5), perforated pots, terra cotta bangles (fig. 28, 6), toy cart wheels (fig. 28, 7) and balls. One painted piece has a fish-scale design.

2) *Fort Mojgarh.* There are only 3 pieces of glazed tiles; these evidently belong to the Muslim Period. In the absence of other objects, a more precise dating of the site is not possible.

3) *Fort Marot* (*fig. 29, 1–5*). The pottery appears to bear a close similarity to the pottery from the other Bahawalpur sites discussed here. Its texture varies from thin to medium-thin. Well-fired, it is red except for one buff sherd. There are also a few pieces of gray pottery. The collection consists mostly of painted ware and the designs are done both in black and chocolate paint on red or buff slip. The ornamental devices, executed crudely, include hatched patterns (fig. 29, 1–2). The pieces represent wide-mouthed deep dishes (fig. 29, 3), bowls, ridged cooking pots (fig. 29, 4), and jar lids (fig. 29, 5).

One large piece of a bowl, light buff slipped and with very fine incised wavy pattern, is of uncertain antiquity. In the absence of any other positive evidence it is not possible to establish its identity.

4) *Lurewala* (*fig. 30, 1–8*). The large pottery collection, like that of Kudwala as discussed above, has 3 types; the first two types in this case also resemble those from Dunkkian. However, the major portion of the collection belongs to the third type which has clear affinities with the Harappa culture pottery. The specimens have a fine and well-burnt fabric with black-on-red painted decoration; and they represent a variety of shapes and sizes. The characteristic designs include thick black bands, plant motif (fig. 30, 1), star (fig. 30, 2), peacock (fig. 30, 3), stylized bull representations (fig. 30, 4), and a variety of geometric patterns.

In form the large fragments represent storage jars, flat dishes (fig. 30, 5) and dish-on-stand (fig. 30, 6). Thin pieces belong to bowls, vases and jars with narrow base, cups, pans and jar covers. Other objects include perforated ware, terra cotta bangles, a toy cart wheel (fig. 30, 7) and a bull with a pierced muzzle (fig. 30, 8).

5) *Dunkkian* (*fig. 31, 1–7*). This may also be conveniently divided into 3 groups: (*a*) plain with smooth, soapy surface (fig. 31, 1); (*b*) plain with rough relief decoration; and (*c*) painted with black designs.

The texture of the first type (*a*) varies from thick to medium-thin. It is wheel-made, well-fired, dark red and with a very fine soapy smooth surface. In form this ware represents flat dishes, jars, cooking pots, open-mouthed shallow bowls, basins and jar covers.

The chief characteristic of the second type (*b*) is its prominent rough relief decoration on the under part (fig. 31, 2–3), while the upper part has the same smooth soapy surface. The purpose of this rough decoration was probably to protect the vessels from quick wear and tear. The designs were perhaps executed by pressing the body of the vessels in a basket or by some other device. This type is represented mostly by large jars and round pots, with a central ridge dividing the rough lower part from the upper body of smooth surface.

The pottery of the third group (*c*) is mostly painted. The large specimens represent open flat dishes (fig. 31, 4) some with decorated rims, and jars on which the ornamentation consists mainly of thick black lines and semicircles. The smaller forms include vases with black decoration on a dark red body. The designs include horizontal bands, thick wavy lines, check patterns, solid suspended circles (fig. 31, 5), multiple loop design and a row of hatched "leaf" pattern suspended from horizontal lines (fig. 31, 6).

A few pieces of ornamented faïence bangles (fig. 31, 7) and a fragment of a perforated ware in the collection suggest affinities with the Indus civilization. The ceramic products of this site in respect to texture and color also bear strong resemblances to the Indus culture pottery, although the designs differ somewhat in details.

6) *Fort Derawar* (*fig. 32, 1–7*). This pottery appears to have clear affinities with the pottery of Harappa culture in texture, shape and decoration although the painted pieces are few. The specimens include fragments of narrow and heavy-based vases (fig. 32, 1), perforated ware (fig. 32, 2–3), knobbed jar lids, vases, tiny vases and pots, cooking vessels with ridge below neck (fig. 32, 4), beakers, jars, terra cotta bangles, toy cart frames, balls and decorated faïence bangles (fig. 32, 5). There are some sherds with typical geometric patterns in black-on-red and incised rope design of the Harappa culture pottery (fig. 32, 6–7). There are fragments of a large pot of thin, well-fired fabric with bold zigzag patterns between horizontal lines.

7) *Qaimpur* (*fig. 33, 1–5*). This pottery seems to possess close affinities with Bahawalpur pottery discussed above. The specimens are mostly decorated with black designs on red ground. Together with the plain ware, they form an homogeneous group. There are also some pieces of plain gray ware.

The texture of this Qaimpur pottery is thin; it is well-fired. Some of the pieces have a red or dark red slip. Decoration consists mostly of horizontal bands, chain and hatched loop patterns, rows of solid painted triangles, chevrons and sigmas in registers on neck or rim (fig. 33, 1–2).

Incised rows of chevrons and nicks also occur. Some of the pots have rough relief surface on the base. But the most interesting piece has low relief ornamentation consisting of dots between horizontal lines and rows of vividly imprinted "pipal" leaves. The piece was probably used for stamping pottery (fig. 33, 3).

The forms include dishes, cooking pots with ridge below neck (fig. 33, 4), narrow-mouthed vessels, saucers, bell-shaped jar covers and deep troughs (fig. 33, 5).

8) *Turewala (fig. 34, 1–7)*. This pottery is also similar to the pottery of Kudwala and Lurewala described above and has three types. It resembles the latter (Lurewala) in almost every detail. In texture and shape the first two types of plain pottery with smooth soapy surface and those with rough relief decoration are the same (fig. 34, 1). The third type has thick black ornamentation.

The third type, which is painted, has clear affinities with the Harappa pottery. The designs consist of wavy and multiple loop patterns, hatched leaflike designs and horizontal bands on the body (fig. 34, 2–4). The forms include heavy bases of beakers (fig. 34, 5), cooking pots with external ridge (fig. 34, 6), bases of goblets, beakers, dishes-on-stands (fig. 34, 7), open bowls, flat dishes, and a few fragments with incised and painted plant and geometric designs.

9) *Sulla (fig. 35, 1–8, fig. 36, 1–3)*. The pottery and other objects consist of plain and painted wares, such as ring-stands (fig. 35, 1), dishes-on-stands (fig. 35, 2), flat dishes (fig. 35, 3), knobbed jar lids (fig. 35, 4), pointed bottom vases with typical incised designs on interior (fig. 35, 5), perforated vessels (fig. 35, 6), terra cotta bangles (fig. 35, 7), toy cart frames (fig. 35, 8), model cakes, etc. (fig. 36, 1), as well as the black painted designs of the typical Indus Valley culture (fig. 36, 2–3), clearly point beyond doubt to its close relationship with the Harappa culture.

10) *Traikoa-Thar (fig. 36, 4)*. The pottery is of thick texture, well-fired, red in color, and with incised horizontal, vertical and wavy line decoration. This ware is probably later than the Harappa culture. The thin incised patterns show some affinities with those of the incised pottery from Jhukar (fig. 36, 4). The fragments are mostly of large storage jars. A few painted sherds have thick black horizontal lines on red ground. Some fragments of perforated ware were also found.

11) *Bhoot (fig. 36, 5–9)*. The pottery forms a small collection of mostly plain red ware, wheel-made and of fine texture. Some sherds are burnt-black, probably due to overfiring. A few pieces have fine relief decoration of horizontal ribs (fig. 36, 5). There are two pieces with a dark red slip bordered by chocolate lines around the neck. The only painted piece has a wavy pattern in dark paint (fig. 36, 6). Some of the pieces have thin wavy incised patterns like those on the pottery from Traikoa-Thar. Such decoration also occurs on Jhukar pottery. The fragments represent dishes, jars with externally ledged rims (fig. 36, 7), narrow-mouthed pots (fig. 36, 8), vases, flat-bottomed and straight-sided shallow basins. Except for one piece of a terra cotta bangle (fig. 36, 9), there is no other minor object from this site.

SUMMARY

We are now in a position to sum up our evidence based on a comparative study of the Baluchistan and Bahawalpur ceramic material. So far as the Baluchistan products are concerned, their chief characteristics are those of being a monochrome black-on-pink or gray ware like the pottery of Shahi-Tump with a free style of ornament, qualities found on the pottery of Seistan and Bampur sites in Iran; and the monochrome and polychrome wares resembling Kulli pottery, which has outside parallels with the "Scarlet ware" of Susa D and Mesopotamia.

The Bahawalpur pottery, black-on-red, is undoubtedly the product of the Harappans.

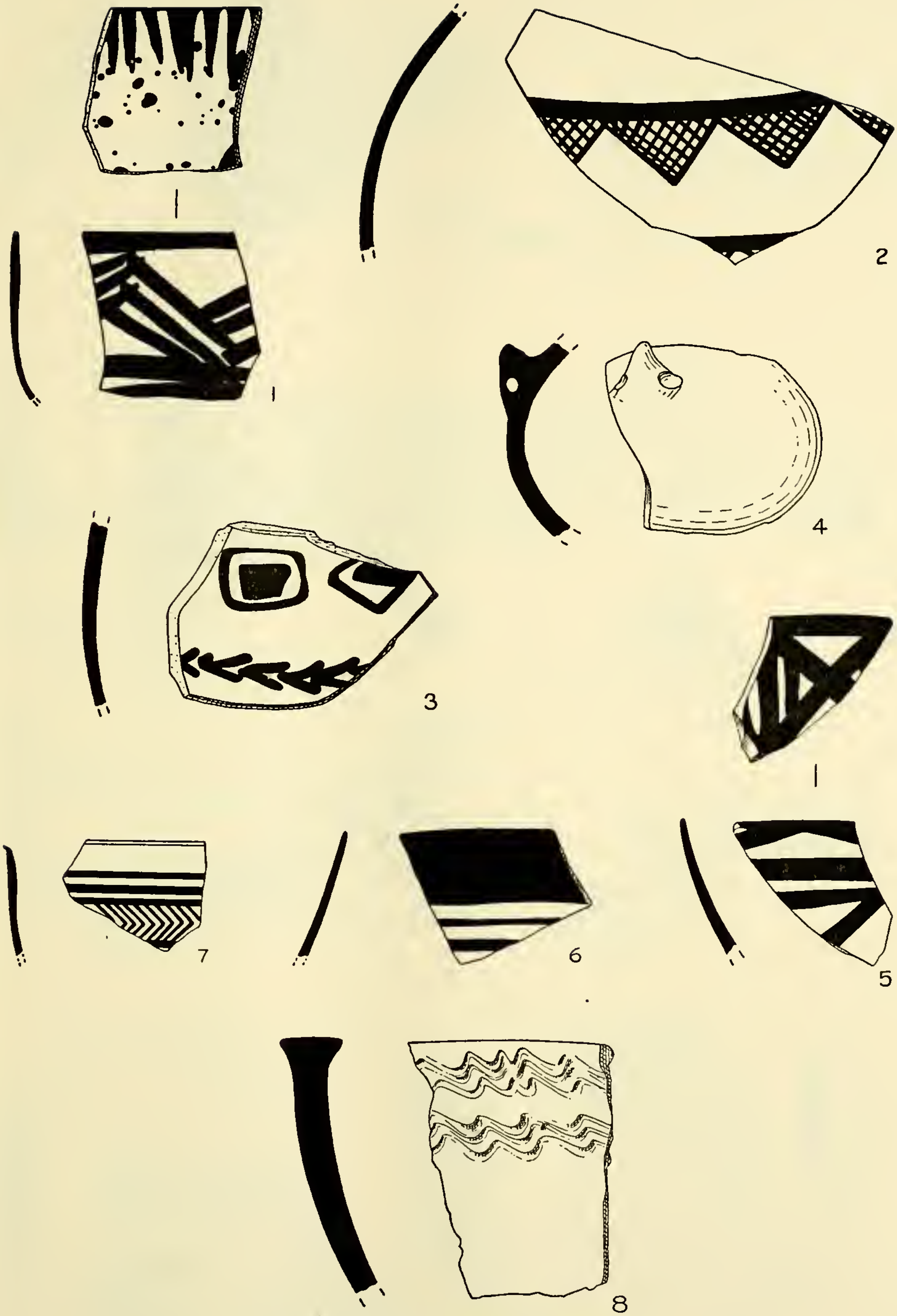

FIG. 20. Shahi-Tump and Fort Miri, Baluchistan.

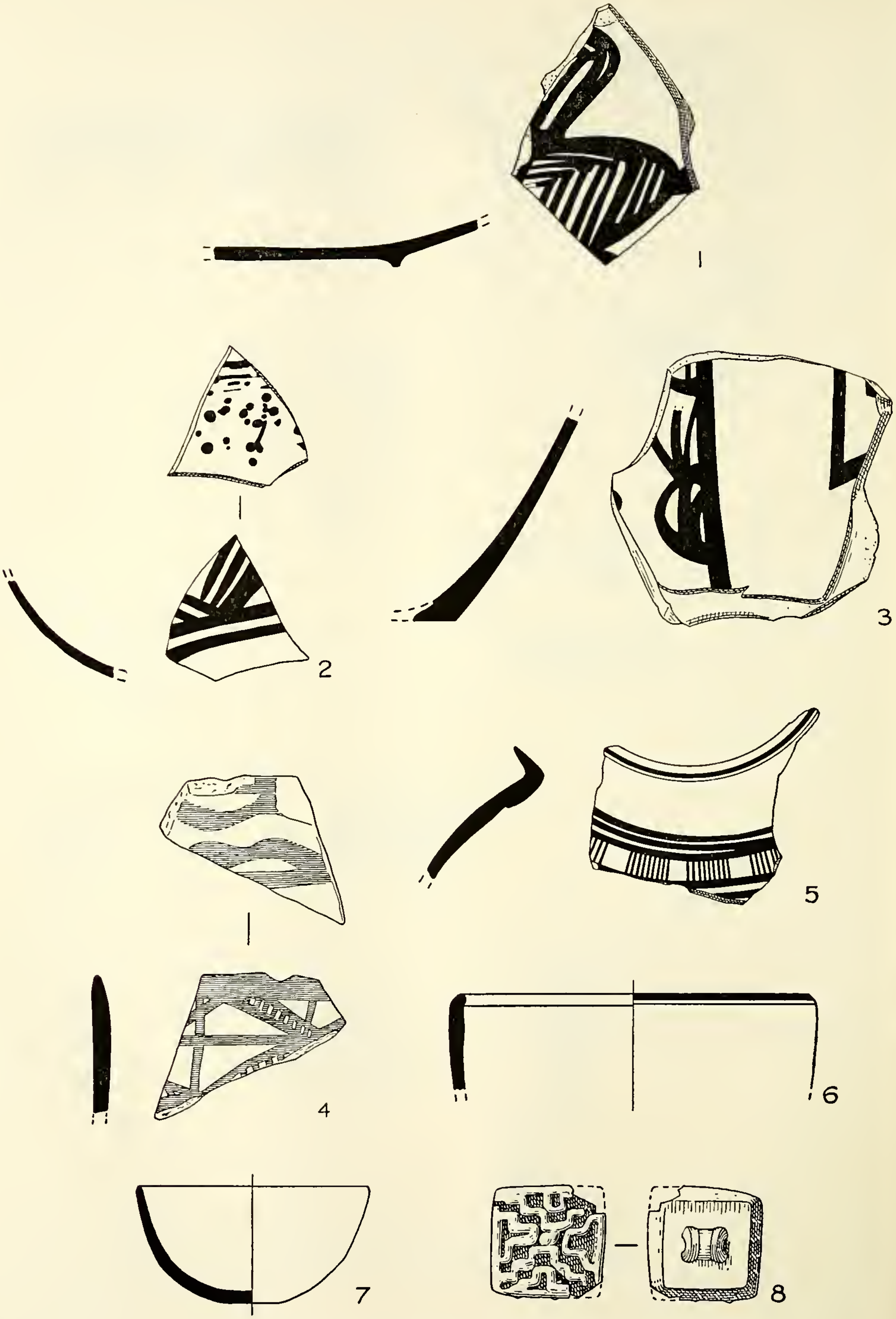

FIG. 21. Nazrabad, Surain-Damb, and Khona-Kalat, Baluchistan.

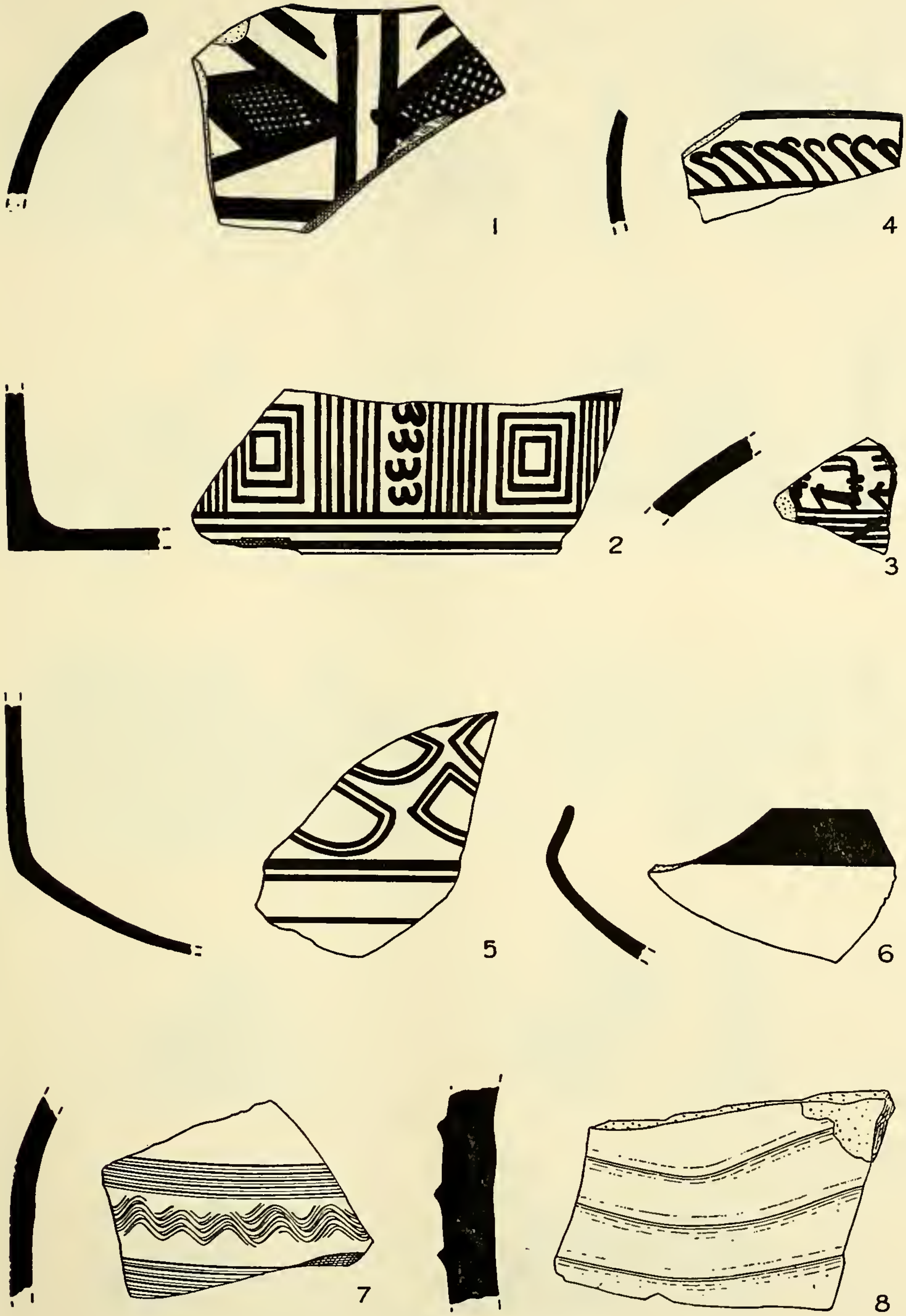

Fig. 22. Sraduk, Baluchistan.

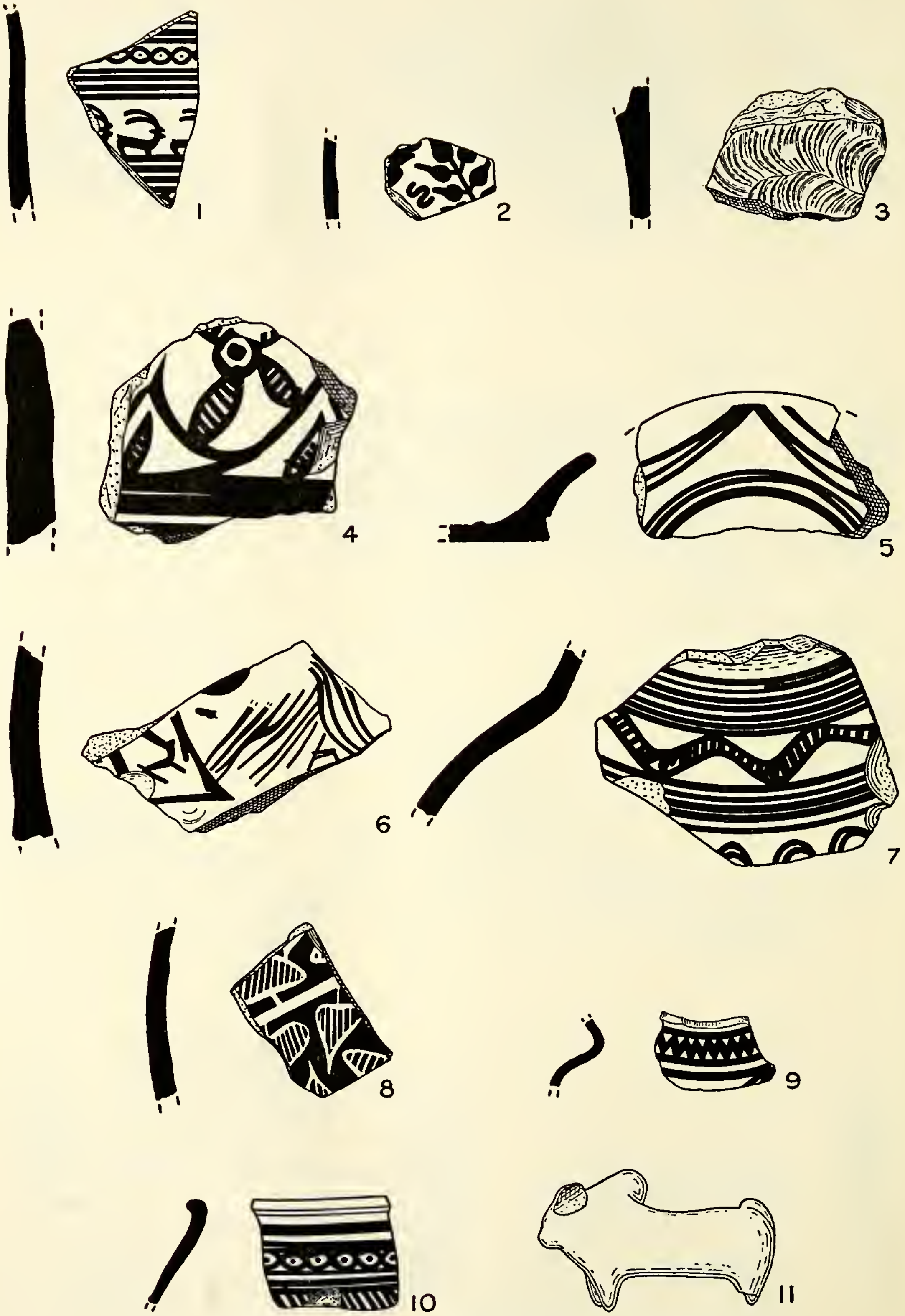

Fig. 23. Damb-i-Dambi and Chiri-Damb, Baluchistan.

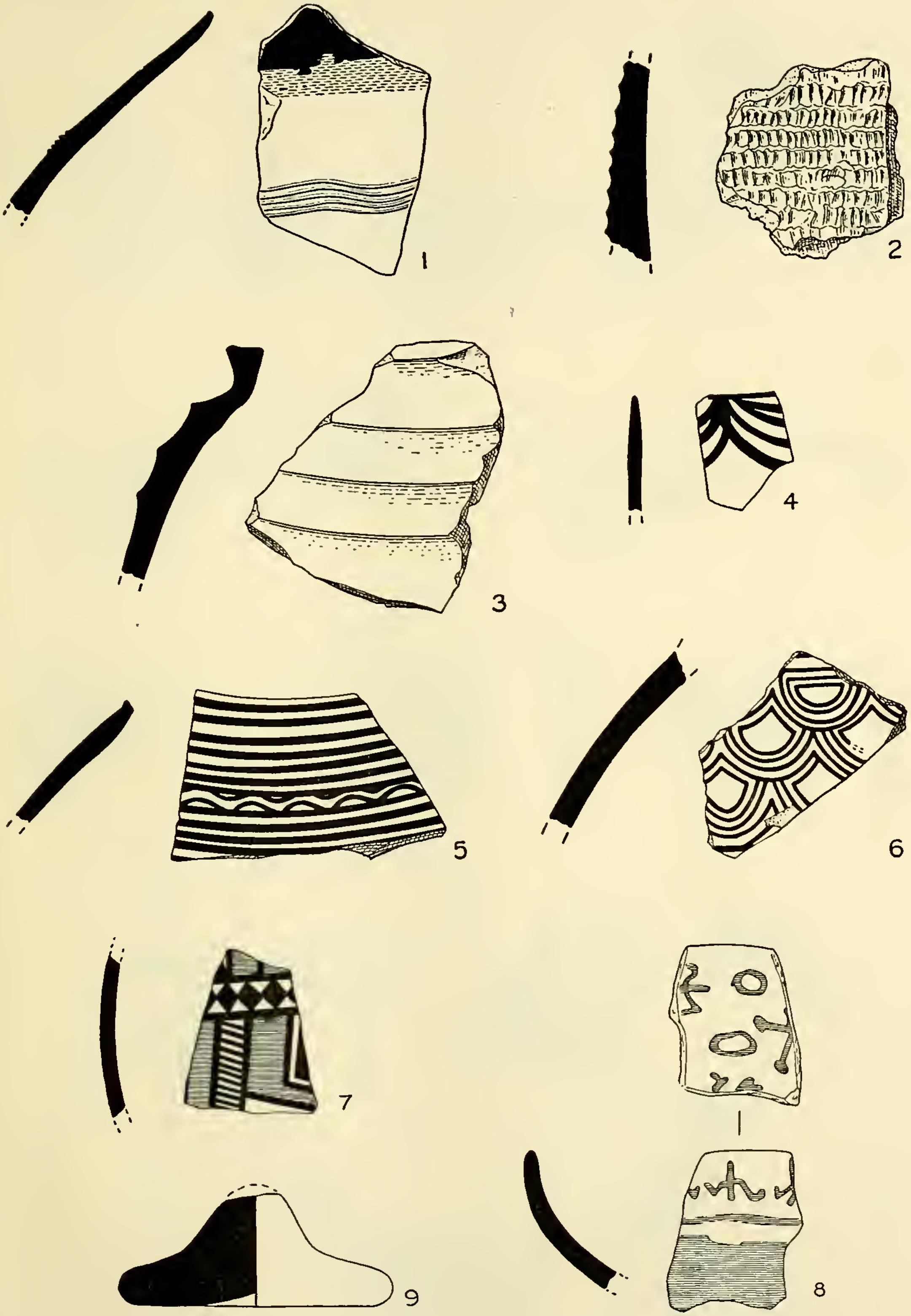

FIG. 24. Chiri-Damb, Sari-Damb, Zayak, and Jangal, Baluchistan.

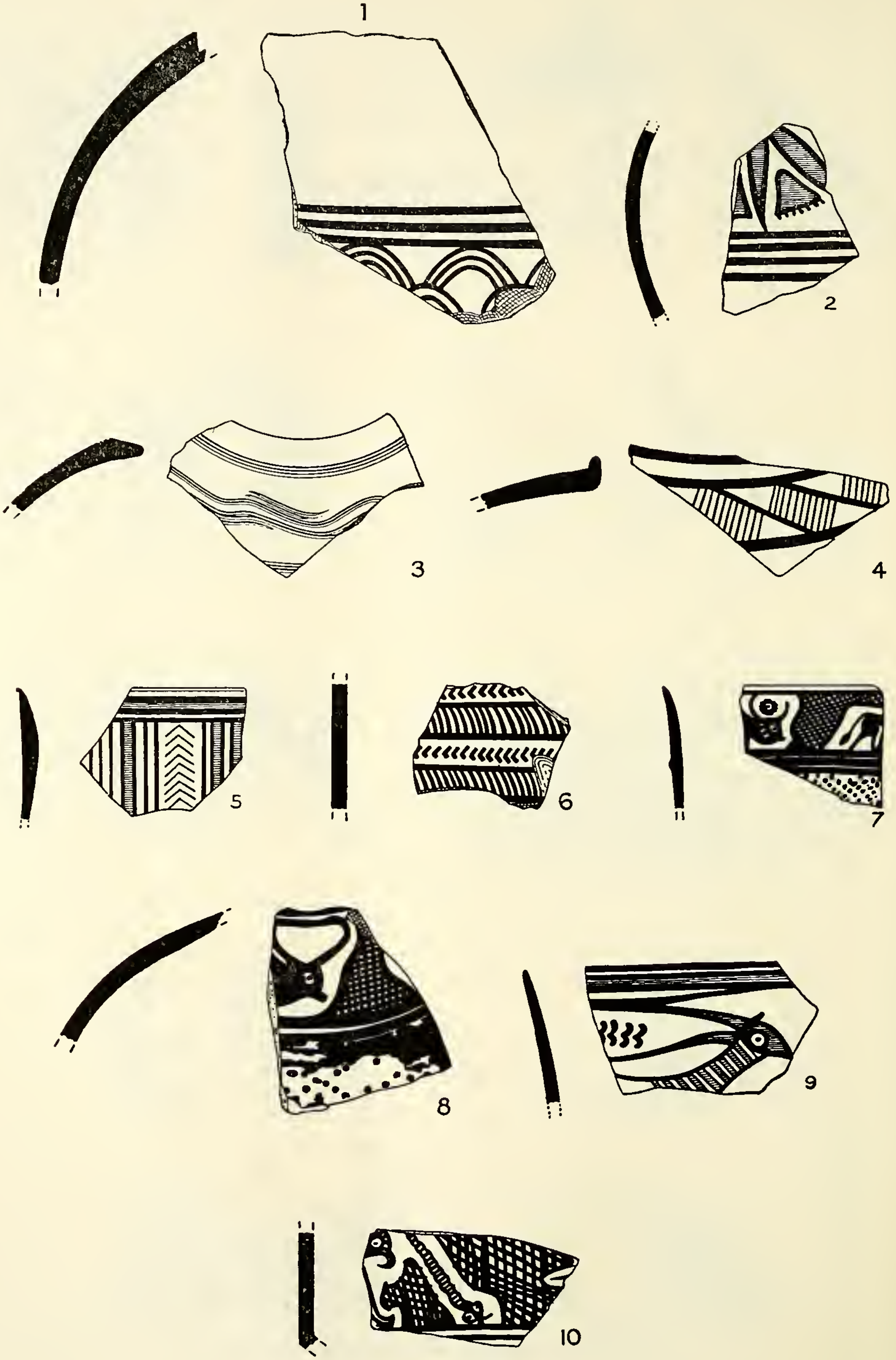

FIG. 25. Shakar Khwan-Damb and Ander-Damb, Baluchistan.

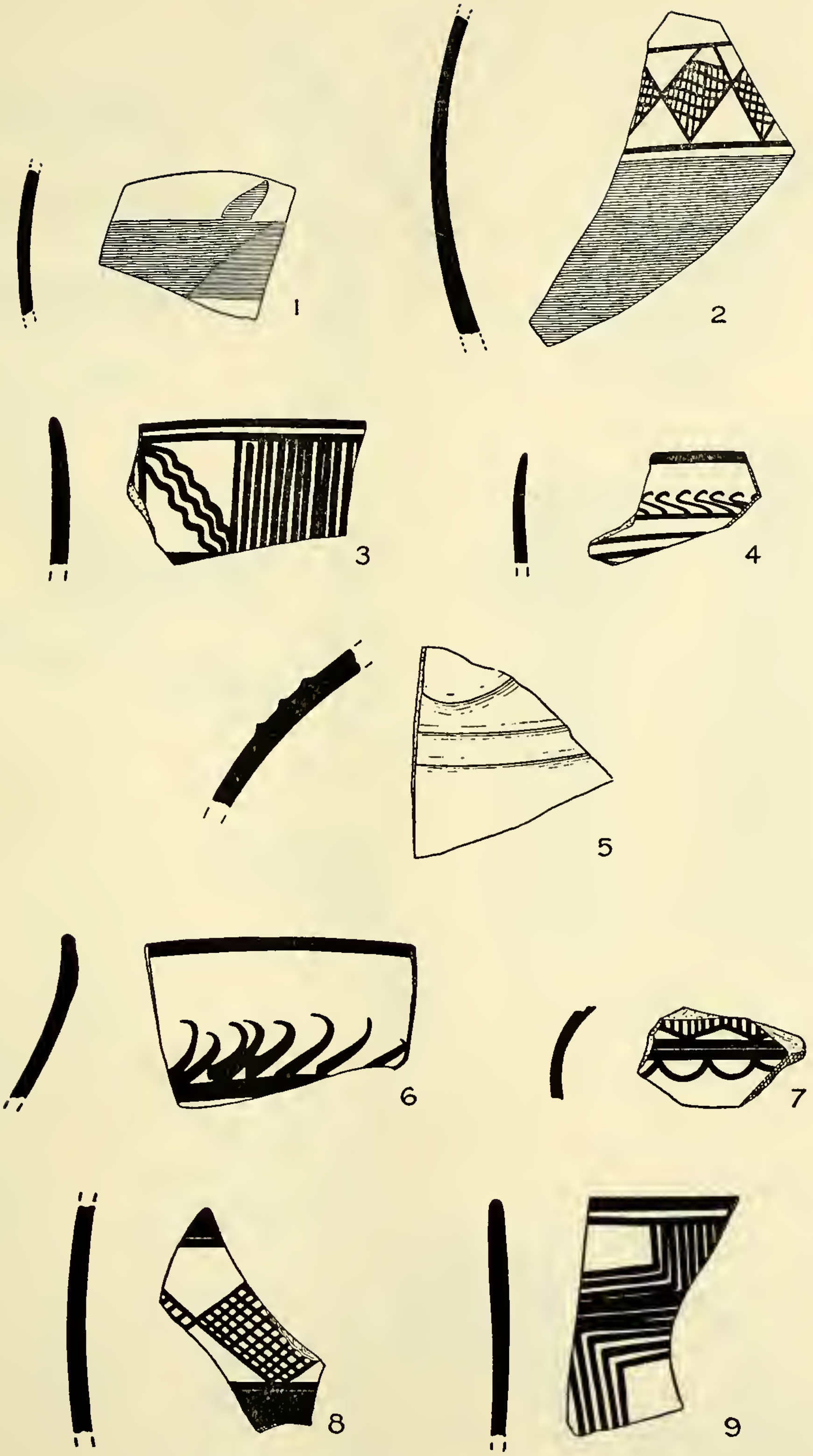

FIG. 26. Ghuram (Benn Chah) and Kapoto, Baluchistan.

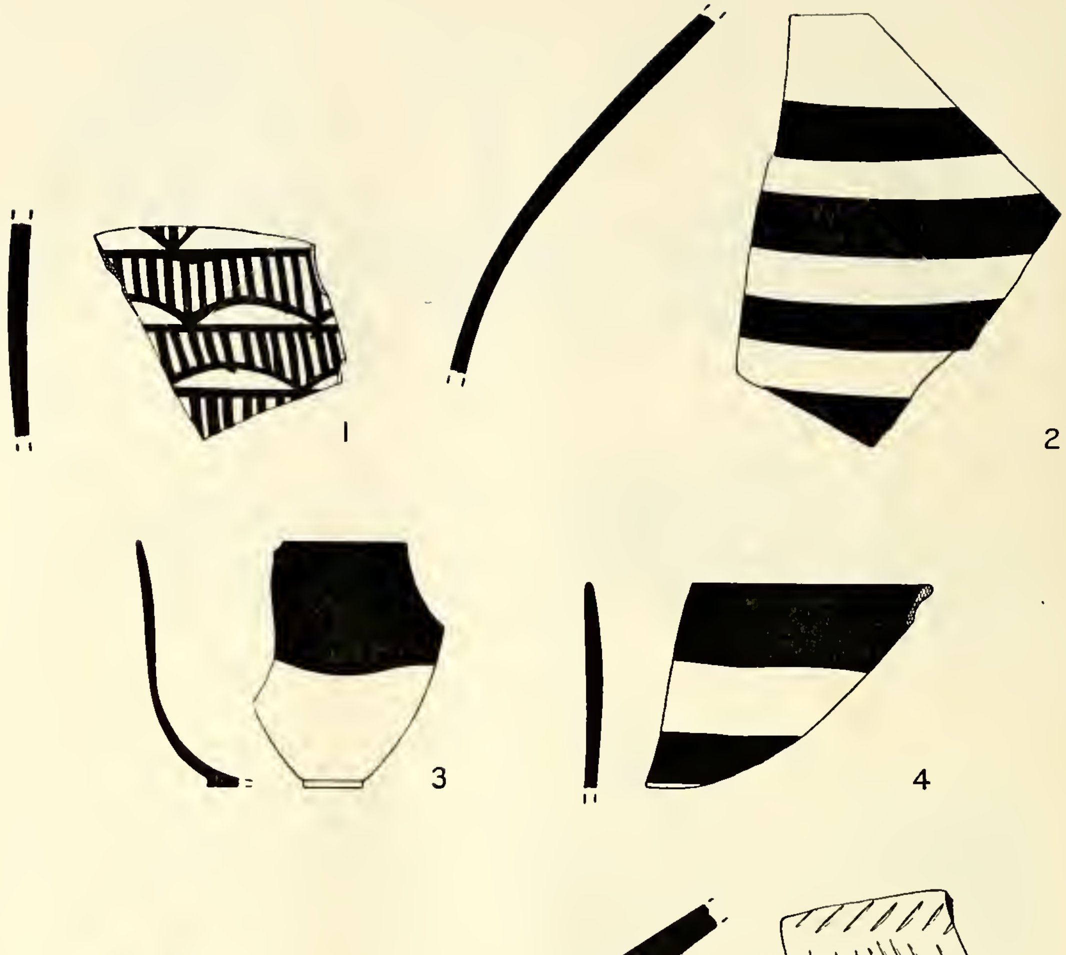

Fig. 27. Kapoto and Kapoto Rock Shelter, Baluchistan.

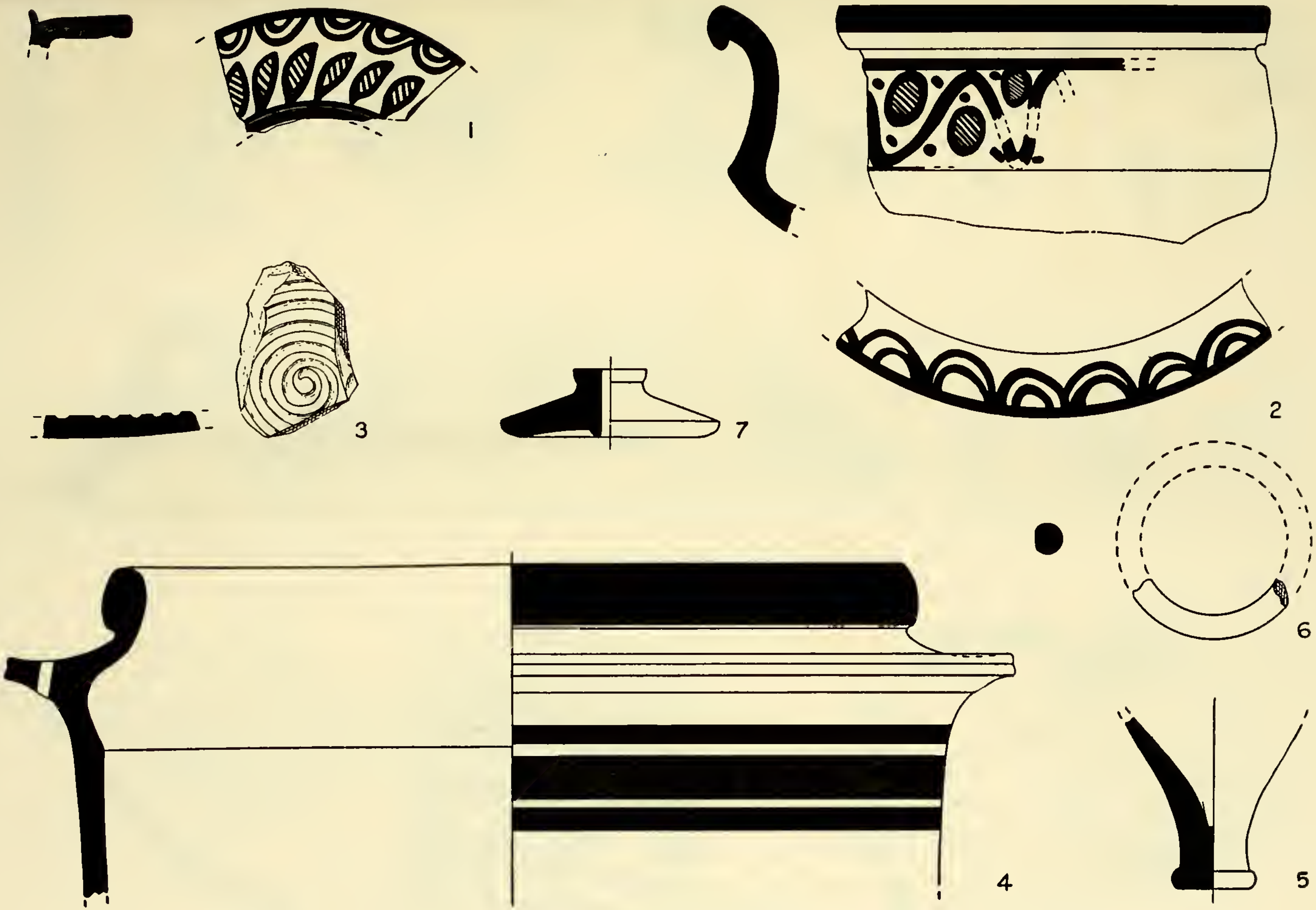

FIG. 28. Kudwala, Bahawalpur.

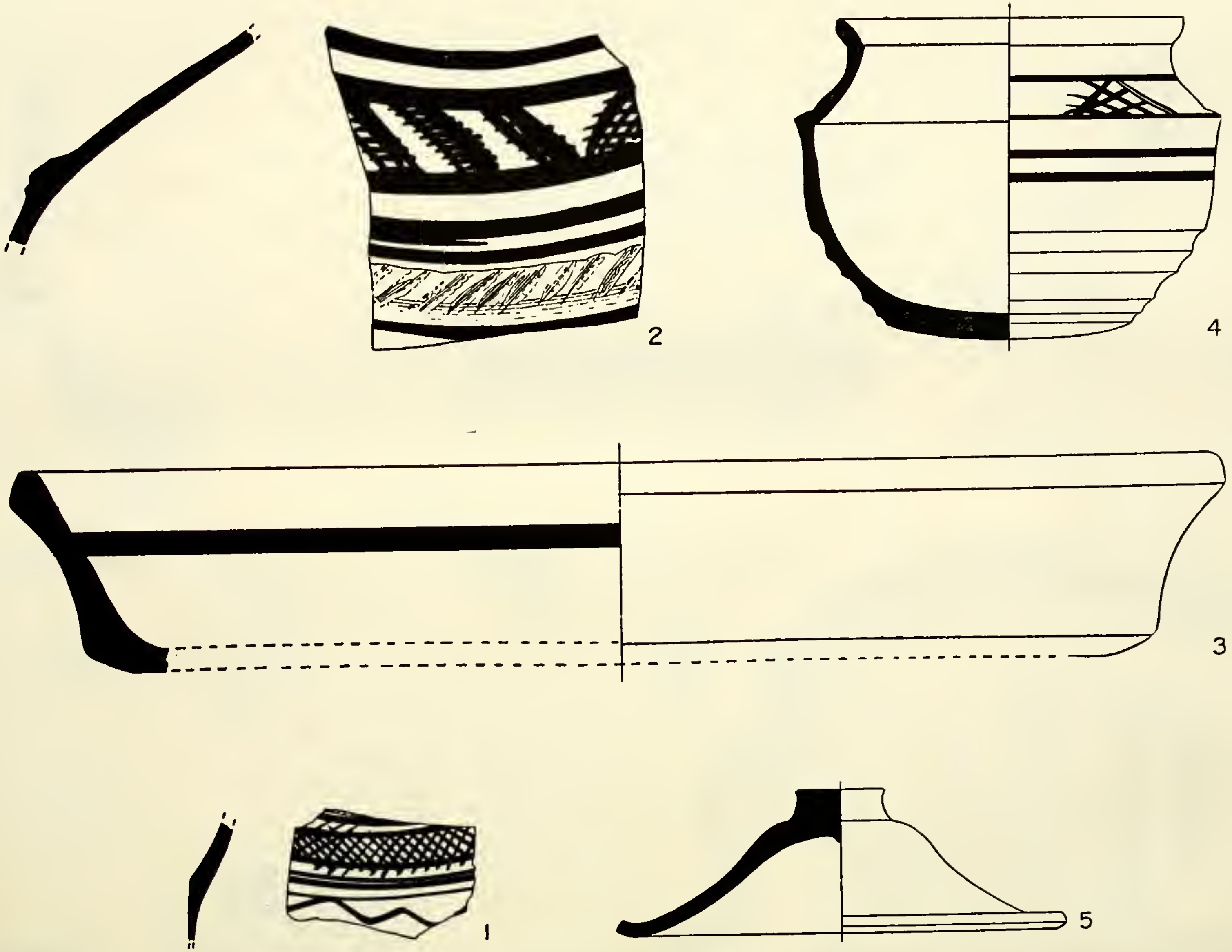

Fig. 29. Fort Marot, Bahawalpur.

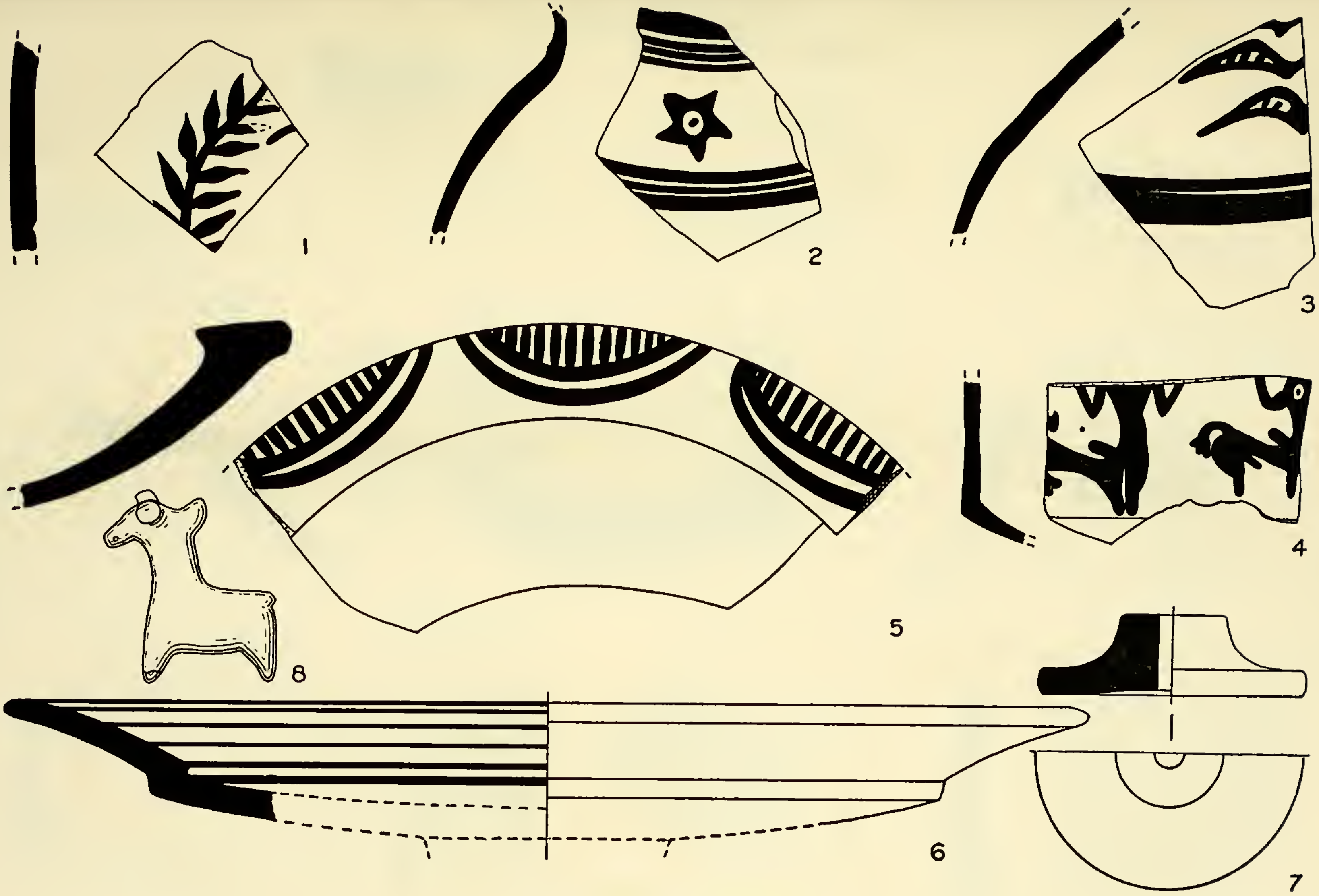

FIG. 30. Lurewala, Bahawalpur.

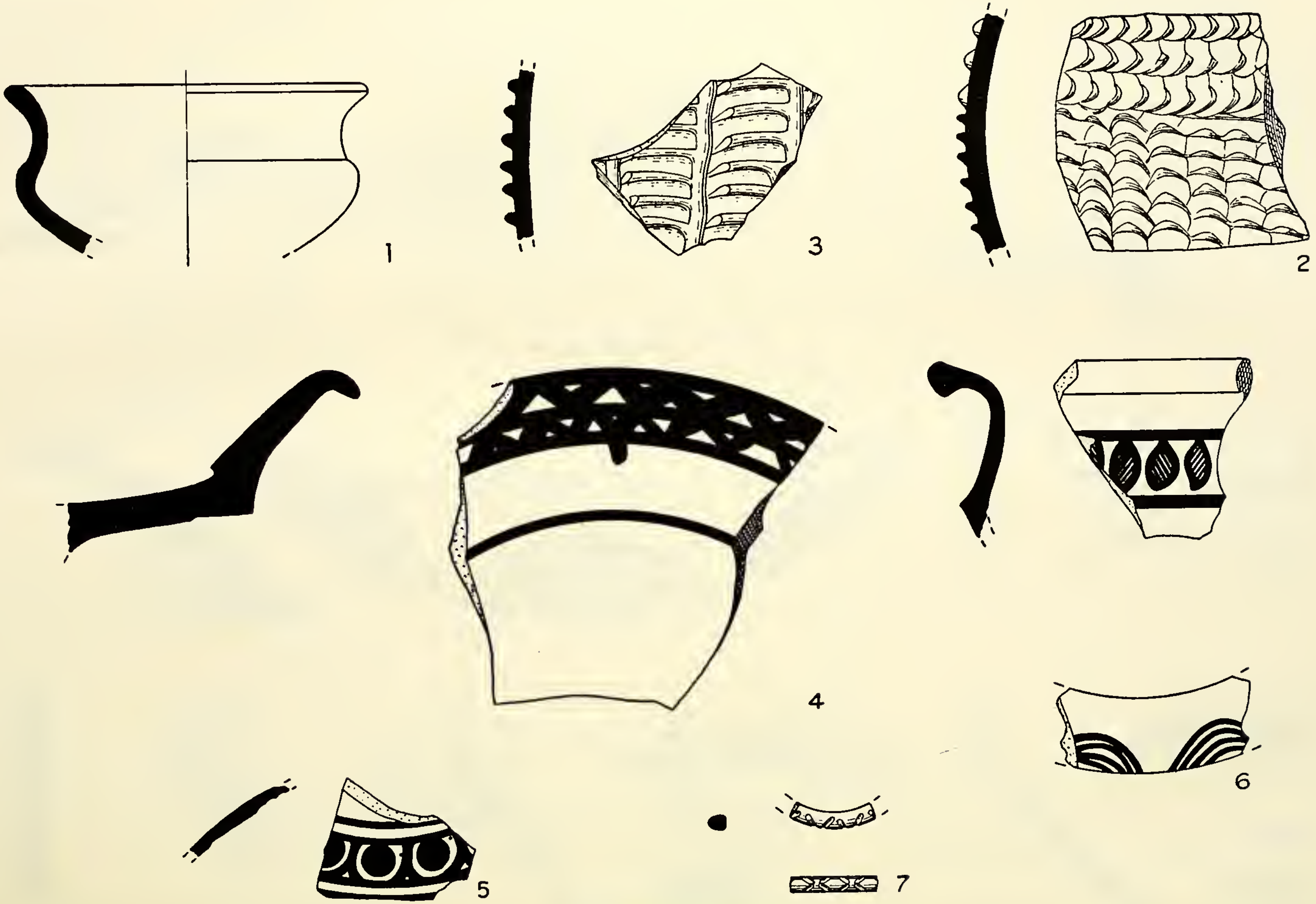

Fig. 31. Dunkkian, Bahawalpur.

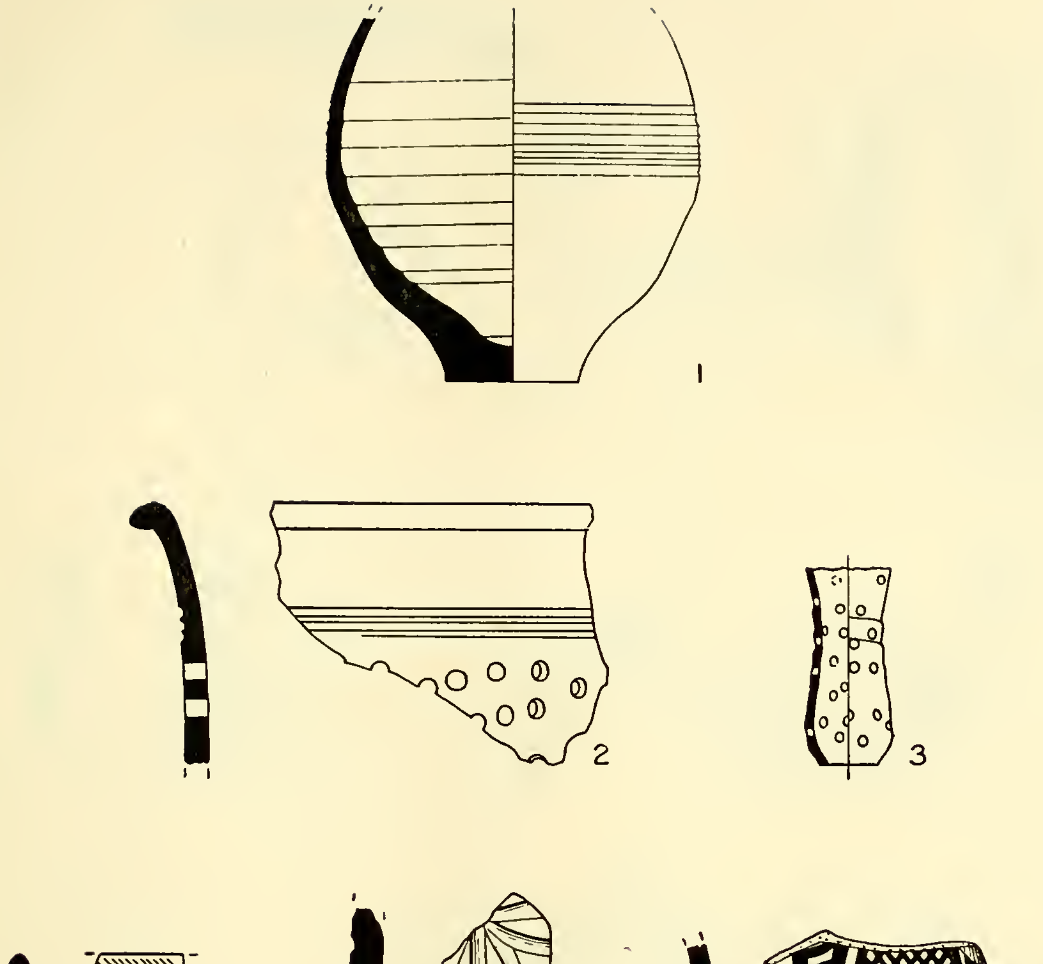

Fig. 32. Fort Derawar, Bahawalpur.

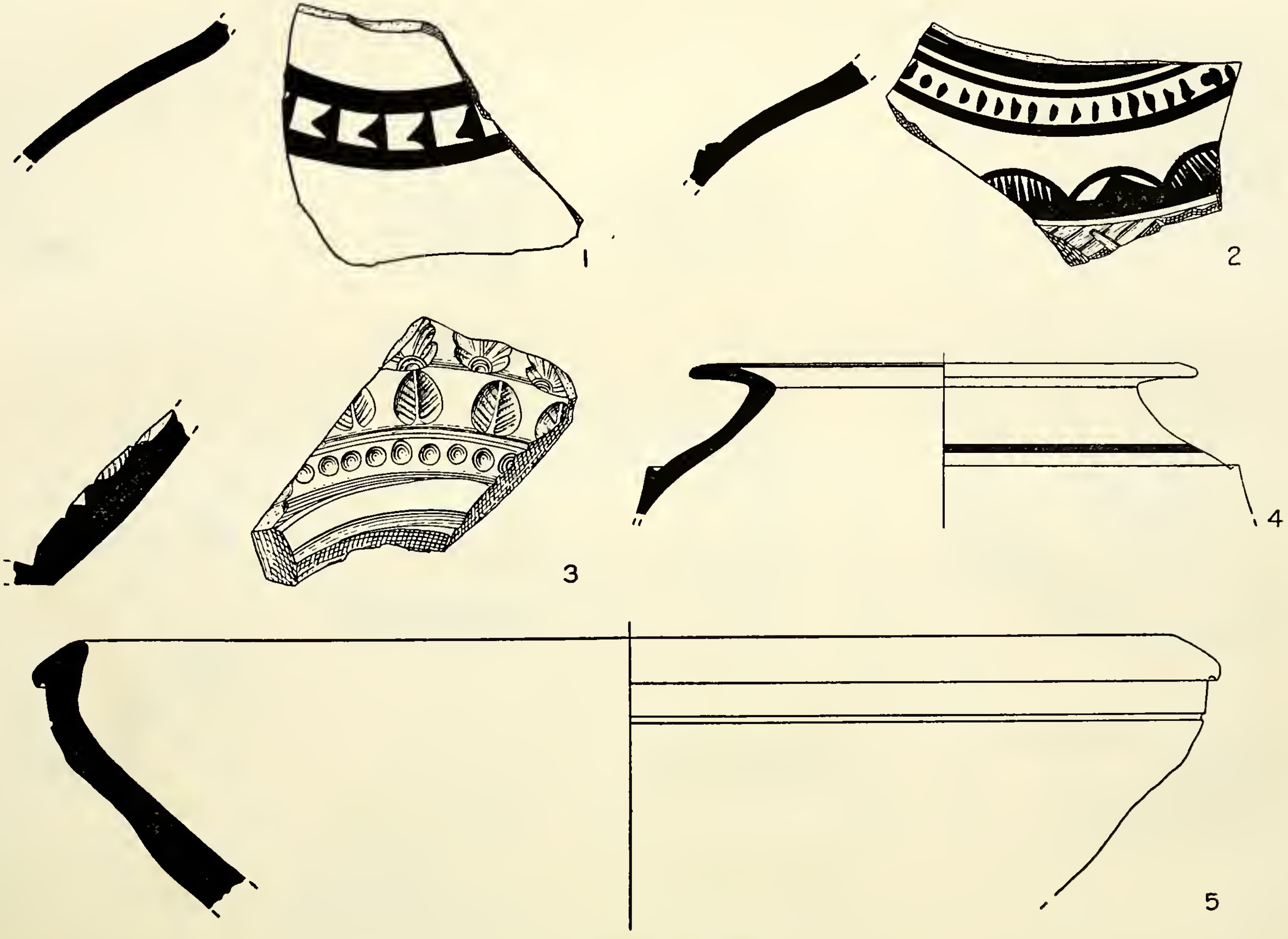

FIG. 33. Qaimpur, Bahawalpur.

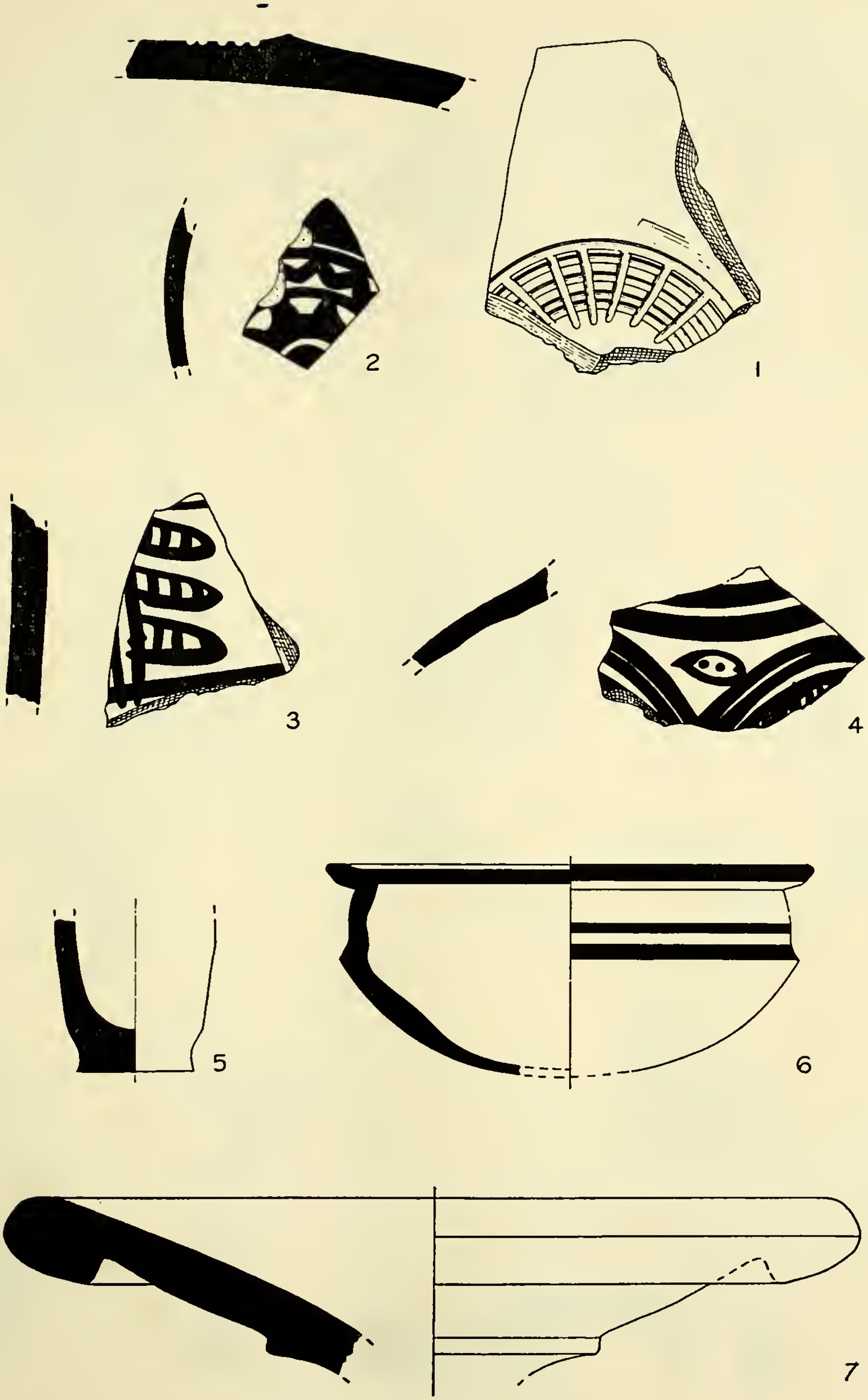

FIG. 34. Turewala, Bahawalpur.

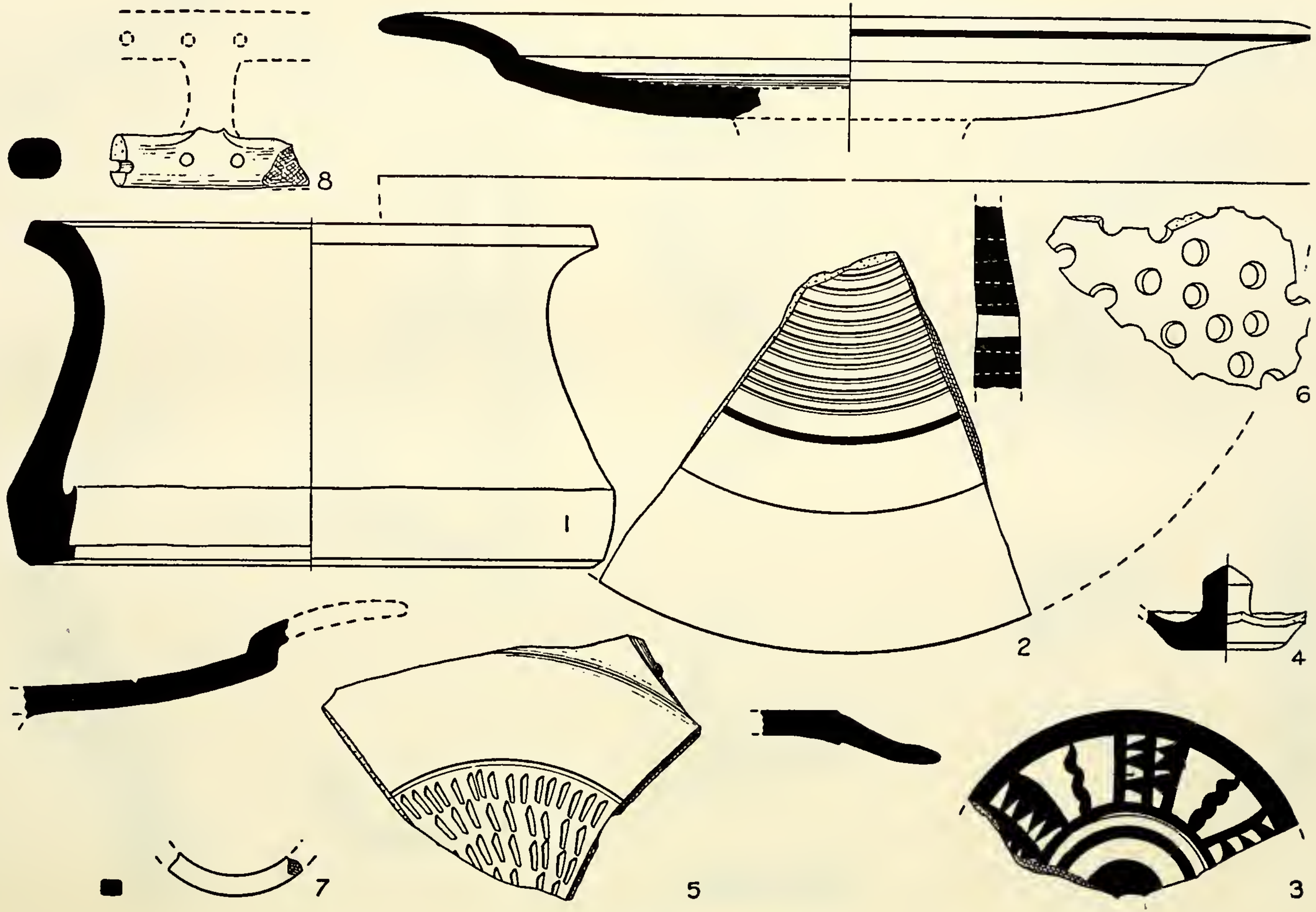

FIG. 35. Sulla, Bahawalpur.

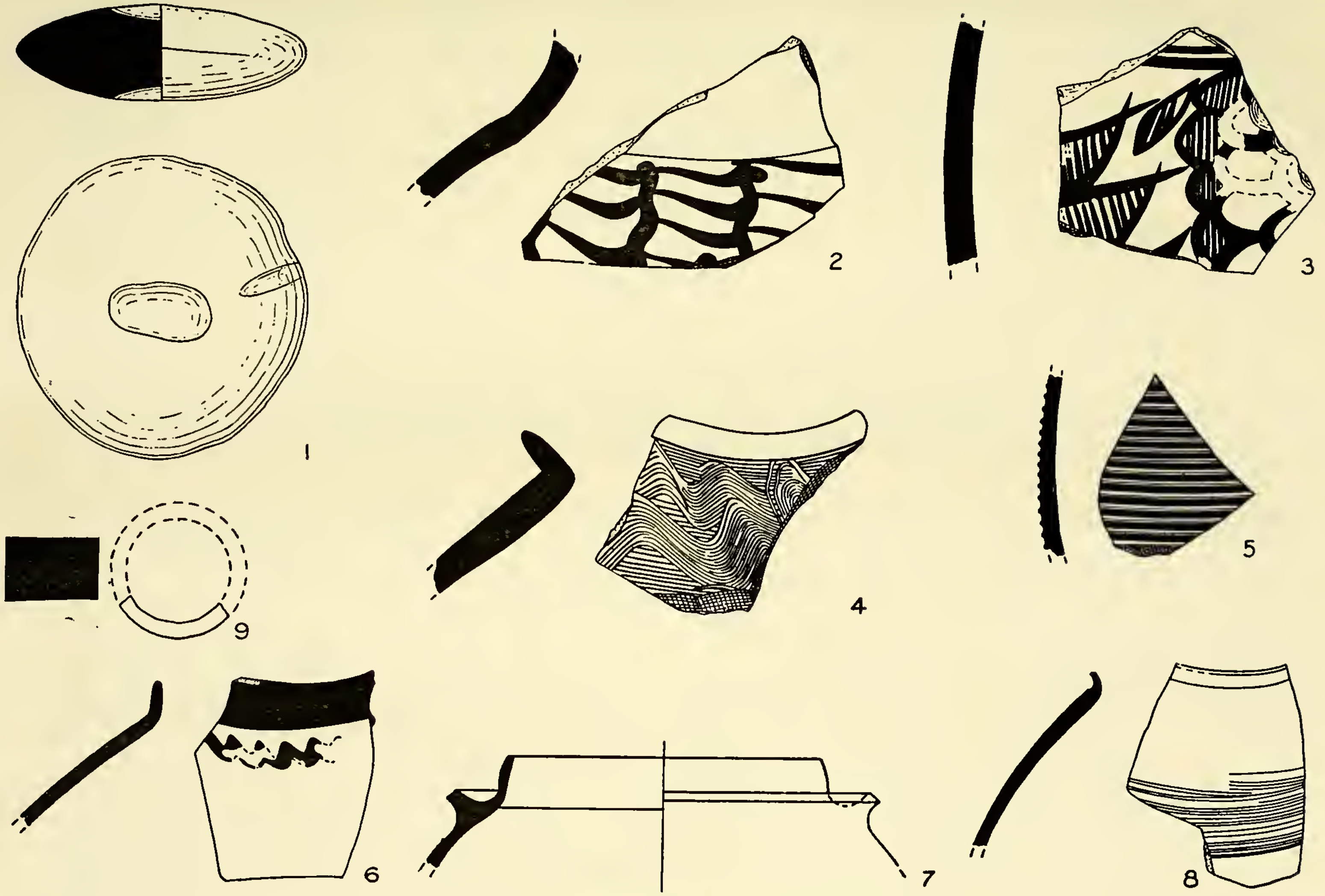

FIG. 36. Sulla, Traikoa-Thar, and Bhoot, Bahawalpur.

APPENDIX B: KARACHI TO THE INDUS[1]

BY HENRY FIELD

ON MARCH 7, 1955 we drove from Karachi eastward along the main road to Tatta. At Landi, about 17 miles from Karachi, we turned 1,000 paces north of the main road to visit the ancient Baluchi (Biloch) cemetery (1,000 x 300 meters). There are approximately 300 graves, all apparently above ground. These are usually known as the Chaukandi tombs.

The majority consist of 2-story, sandstone tombs richly carved. Some have 3 stories, but all are of pyramidal construction. Rosette designs predominate. Among the many slabs elaborately carved in relief are men on horseback, archers and geometric patterns. The graves of ladies have ornaments, such as necklaces, rings, earrings and bracelets.

Some of these graves are placed under pillared canopies of Hindu style. The eastern approach is dominated by a small, white dome supported by pillars.

This cemetery is attributed to the seventeenth-eighteenth century, although some graves belong to the nineteenth century. During our brief visit, I observed that several tombs contained fragmentary skeletons resting on the second tier; none were charred. In 4 of these were human bones; one with part of the right parietal with gelatine absent.

We returned to the main road and turning east crossed a flat plain with low hills forming a horseshoe directly ahead. The vegetation consisted of large clumps of cacti and low, thorny bushes.

At Mile 22 we turned south to visit a nearby hill (75 feet) just before reaching Pipli Police Post, the entrance to Sind. I collected 1 chert flake, 1 unpainted sherd and some small shells. On the hilltop 2 small shelters had been dug and stones piled to make sides.

About 30 minutes after entering Sind we came to Dabeji village with its few mud-brick houses. A few miles beyond lay Gharo with several wind towers. We drove through Gujo and turned south along a narrow track toward a high hill about 2 miles to the southeast.

Leaving the car beside an irrigation ditch, we walked for 45 minutes across the plain studded with thorn trees and low bushes and up the steep, rocky slope (300 feet) toward the white dome and walls surrounding the tomb of Shah Hussein. The western slope was dotted with walled, some roofed, tombs.

The guardian of this sacred spot greeted us graciously and offered to show Idris and Ali inside the tomb. Permission was given for Mrs. Field to take some photographs.

Along the crest of the hill, which ran north–south, were smaller tombs, especially south of the white buildings. Several were richly ornamented. Inside a low-walled enclosure, with delicate designs, a large foot print was preserved. Whether this was believed to be that of Shah Hussein or a Moslem saint, we were unable to determine from the guide. The only inscription found was photographed.

On the eastern slope, about 50 feet from the crest and just north of the main tomb, some unpainted pottery was collected. This was similar in texture and finish to modern vessels used in this part of Sind. No flint or chert was seen.

We returned on foot to the car and continued eastward to Tatta (Thatta), 62 miles from Karachi. Next morning we drove about 2 miles west to the Makli Hills, which stand on a tableland running for 4–5 miles north–south. This is a vast cemetery which has been in constant use for hundreds of years and contains, at a rough guess, not less than a million tombs where Samah Arghun, Tarkhan and Moghuls lie buried. The monuments are of 2 distinct styles of work. Some are constructed of buff-colored sandstone exquisitely carved with surface tracery. The gravestones are also very elaborately covered with fretted veneer in beautifully designed panels filled with interlaced Persian or Arabic inscriptions. The others are built of brickwork except for the plinth on which they stand and depend for their decoration on a lavish use of enamelled tiles in rich, dark purplish-blue, light greenish-turquoise blue and white.

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[1] Mrs. Field and I were accompanied by Mohammed Idris Saddiqi, Department of Archæology, and driver Ali.

Later we drove 5 miles through Tatta to Pattan Ferry. Here was our first view of the Indus River. The western bank was about 75 feet high and the river perhaps 500 yards wide at this point with a wide bend to the southeast just below the ferry. We hired a large sailboat (S. *horo,* U. *kashti,* H. *nao*) from a local boatman (S. *nako,* H. *nakhuda*) for 3 hours to watch natives fishing with nets (large, S. *ratch;* small, S. *jali*). We passed a small sailboat (S. *dundi,* U. *dunghi*) loaded with firewood. Our boatman supplied the following local Sindi words: sail (*sirh*), rudder (*sukhan*), prow (*mohrah*), anchor (*natari*), deck (*galaieh*), bell (*charra*) and clapper (*awaz*). The 4 principal kinds of local fish in Sind were: *palla, pamphlate, surmai* and *kurriri* and a minnow (*daiend*).

We watched a dozen Sindis setting out a fish trap with 75 wooden stakes (S. *khutthi*) bent toward the tide with 2 triangles set at the maximum force of the current. The net was then looped over the stakes. Time did not permit us to see the catch.

We drove back to Tatta and returned to Karachi late that night.

Appendix C: EXPLORATIONS IN BIKANIR

by A. Ghosh [1]

(Director General of Archæology in India)

THIS REPORT describes the results obtained by an archæological exploration in the valley of the "lost" rivers Sarasvati and Drishadvati in the northern part of the Bikanir Division of Rajasthan State, which I had the privilege of carrying out on behalf of the Department of Archæology of the Government of India. The results obtained so far are of great significance.

Let me describe the geographical features of the land under investigation for, in this case, Geography is more directly related to Archæology than usual. Rising in the submontane regions of the Ambala District, the Sarasvati at present pursues its feeble course past Kurukshetra, Thaneswar and Pehoa—all of them ancient towns—and is met by a few other channels before joining the Ghaggar, a more northern stream, at a place near Shatrana.

Thereafter, the combined stream, now known as the Ghaggar, but anciently by the name of the more renowned component, Sarasvati, flows in a southwesterly direction, enters the Hissar District and flowing near the town of Sirsa, the name of which owes its origin to the river itself, enters Bikanir State. By now, or even before this, it has ceased to be a perpetual stream. During the rains, however, the floodwater reaches more southwesterly points through the ancient channel.

In Bikanir the dried-up bed is clearly traced in a westerly direction until it reaches the town of Hanumangarh, renamed in the last decade as Sadulgarh, but anciently known as Bhatner. Here the channel is met by another from the northeast, now known as Naiwala, and identified as an ancient bed of the Sutlej which, in ancient times, formed part of the Sarasvati system and had not captured the Beas, thus to flow into the Indus.

Southeast of Hanumangarh, the river bed, marked by sand ridges on both sides and locally known as the Nali, reaches the *Tahsil* headquarters at Suratgarh, where it is joined from the east by another dried-up stream, the ancient Drishadvati, which I shall describe later.

Beyond Suratgarh, the river, as indicated by the sandbanks now attaining greater heights, flowed past another but smaller Tahsil town of Anupgarh and beyond 6 miles or so, enters Bahawalpur State, now in West Pakistan, and therefore beyond the scope of my exploration.

Between the sandbanks of the river, separated from each other by 3–6 miles, lies a stretch of alluvium, usually covered with wild shrubs, but sometimes absolutely flat and shiny with not a blade of grass growing on it. Such lands are locally known as *tal* and abound in spots where mirages are frequently seen. Wherever the parched alluvium is irrigated by modern canals, it yields a harvest of summer and winter crops as rich as the Indo-Gangetic plain, of which the region anciently formed a part. The traveler is forced to look toward the sand ridges in the distant northern and southern skyline to be reminded that he is in the midst of an erstwhile wasteland.

The Drishadvati also rises in the submontane Himalayan region, but farther south than the Sarasvati. Such part of the river as still exists in East Punjab is known as the Chitang, and the river bed can be traced through Bhadra, a northeastern town in Bikanir, with Firuz Shah's western Jamna Canal flowing through part of its valley. Beyond Bhadra it flowed through the town of Nohar, and further down, past the site of the modern village of Rawatsar, from where the northern sandbank of the river becomes visible. Its bed further west is now a complete wasteland, until it can be seen to have met the Sarasvati at a place about 3 miles north of Suratgarh.

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[1] This paper was read to the All-India History Congress in Jaipur on December 29, 1951. Dr. Ghosh kindly consented to allow this preliminary report to be published here. Since 1951 new discoveries have shed new light on the ancient cultures of Bikanir. Minor editorial revisions were made to conform to our style. (H.F.)

It was in the midst of these surroundings—usually barren waste, but sometimes green with vegetation as the irrigated region between Suratgarh and Anupgarh—that lie the ancient sites to be described. The valley between the Sarasvati and Drishadvati was the holy land of Brahmavarta according to Manu. To the north of the Drishadvati and to the south of the Sarasvati lay Kurukshetra, the holiest of the holy, and according to the *Mahabharata*, those who lived in Kurukshetra lived in heaven. No wonder that the land is found to be so full of archæological relics!

Part of the Sarasvati Valley in Bikanir had already been surveyed by the renowned explorer Sir Aurel Stein, who, with his fondness for regions unknown, devoted the winter season of 1940–41 to investigating the remains in this region as well as in the adjoining Bahawalpur State. He published a short summary of his work in the *Geographical Journal*, 1942. We are also fortunate in having recovered, after his death, his typescript report, which will be published by us as soon as circumstances permit, for anything from the pen of the great explorer makes fascinating reading and is of biographical, if of no other, interest. But his work, so far as it relates to Bikanir, has been entirely superseded by the present work. His observations have been found to be very incomplete, and his conclusion that there are no "prehistoric mounds east of Fort Abbas in Bahawalpur State with pottery of the Chalcolithic period," by which he no doubt means the culture represented at Harappa and Mohenjo-daro, has been rendered utterly untenable by the present exploration.

This remark of his is all the more astonishing in view of the fact that some of the sites found by us to belong definitely to that culture had been visited but dismissed by him as having "indeterminate plain ware and scarce fragments decorated with simple black bands or coarsely impressed patterns."

In view of Stein's statement which had led us to believe that nothing very ancient would be found in the region, it was a great thrill for us, when even on the first and second days of our exploration, we found sites with unmistakable affinities with the cultures of Harappa and Mohenjo-daro. And a few subsequent days' work convinced us that the Sarasvati Valley had been really a commingling of many rivers, not only geographically, but culturally.

The number of ancient sites plotted on the map as a result of my exploration is more than 100, and, taking into consideration the limited area explored, the valleys of the Sarasvati and the Drishadvati must be regarded as very rich indeed in archæological remains. But the richness does not consist only in the number of the discovered sites, but in their vast chronological and cultural range. For they comprise relics of several millennia of Indian history right from the Harappa period to comparatively recent historical times.

The earliest group of sites represents the same phase of Indian history as the twin cities of Harappa and Mohenjo-daro, labeled as the Indus Civilization—a term inexact in both its geographical and chronological aspects. For the culture extended far beyond the Indus basin, a fact which gives a geographical lie to the term, and that basin itself witnessed many more cultures, earlier and much later—a fact which gives it a chronological insignificance.

More than 25 mounds of this culture, which should be called the Harappa culture, have been identified so far in the explored region, beginning right from the Pakistan border up to midway between Hanumangarh and Suratgarh in the Sarasvati Valley, and about 16 miles east of Bhadra in the Drishadvati Valley, near the border between Bikanir and East Punjab.

In the Sarasvati Valley, as explored, the colossal mound of Kalibanga stands, as it were, as the easternmost outpost of this great culture, although there is little doubt that more of its remains await identification further east. The discovery of these mounds brings the Harappa culture much nearer the heart of India and reveals how deeply it had taken its roots in the Indian soil.

Ere this, the mound at Rupar, near the bank of the Sutlej in the Ambala District, stood as an isolated representative of this culture. Now the chances of establishing a continuous chain of sites of the culture are brighter than before. With its centers dispersed from Baluchistan to the eastern limits of Bikanir, a distance of more than 700 miles, the culture must be regarded as one of the mightiest in the Ancient Orient.

The Harappa mounds on the Sarasvati, although most of them are the remains of small settlements, yield the same types of pottery and other objects as those further west in Bahawalpur, Sind and Baluchistan. Typical food dishes, goblets with narrow bases, other pottery painted with designs in black against a red-slipped background, disc circular beads, typical terra cotta toy carts, flat triangular and circular double-convex terra cotta cakes, long blades of chert—in fact, all the material features of the Harappa culture are present on these sites and bespeak an absolute homogeneity of culture.

Only one steatite seal, another characteristic product of the Harappa culture, was found, but this paucity can well be explained by the seals having been used for purposes, most probably commercial, which were appropriate only to the large cities of Harappa and Mohenjo-daro. The discovered specimen, although fragmentary, can be recognized as a disc circular in shape with an incised animal design and an inscription at the top, only one letter of which is partially preserved.

I may note here that seals of this shape, as distinct from the more common rectangular or square seals, were found by Vats in the early levels of Mound "F" at Harappa. All these finds leave no doubt that it is the true Harappa culture and not an offshoot or survival thereof that is represented in the Sarasvati Valley.

In the explored Drishadvati Valley there were also a few sites, one of them fairly extensive, with unmistakable Harappan affinities, but there are a few differences in pottery fabric and types. They may be regarded as the eastern variety of the Harappa culture, and it is not unlikely that they flourished at a period later than true Harappa. This phase of the culture requires further investigation. All the same, they emphasize the eastern extent of the culture.

The next group of sites comprises a typical pottery, gray in color and with or without black painted designs, and a mass of associated pottery quite distinct from that of Harappa or of the succeeding cultures. Gray ware has recently assumed importance in North Indian archæology and has been found on many early sites in PEPSU, East Punjab and West United Provinces. To this list has to be added about 20 sites now found in the explored region in the Sarasvati Valley in Bikanir. In the Drishadvati Valley, only one gray-ware site was found, and that too with a coarser variety of gray ware.

The vessels in gray ware are restricted in shape, being confined to dishes and bowls. The painted designs also present a limited variety. Together with the gray ware vessels are found an enormous amount of red pottery with shallow impressed designs and with a base besmeared with coarse grits. Some of the red pottery types are similar to types also found associated with gray ware in the Hastinapur excavations. However, many are the new types both at Hastinapur and Bikanir, and they no doubt represent the local creations of the gray-ware people.

About the other material aspects of this culture we have little evidence as yet. In Bikanir at any rate, these sites are rather small in extent and present few features. The houses appear to have been of mud-walls; the use of mud-bricks, not to speak of baked bricks, is not in evidence. In general, the culture presents more primitive features than Harappa.

The terminal dates of this culture remain uncertain. It appears that 600 B.C. may represent a very rough central date for this culture. Toward the final phases, it touched the historical cultures of the Mauryan and post-Mauryan times. How much earlier than 600 B.C. again requires further investigation. One thing appears certain; on practically all the gray-ware sites in Bikanir and elsewhere, settlement began with gray ware. The people of this culture broke new ground to build their villages and did not utilize any existing mounds for the purpose.

The next group accounts for a large number of sites, some of them, especially those near Suratgarh, of very large dimensions. I propose to christen these sites collectively as Rangmahal and the culture represented in them as Rangmahal culture, after one of the leading and well-known sites near Suratgarh.

The Rangmahal pottery industry was very sturdy and productive. The shapes represented are many, and the painted designs in black or, rarely, in crimson, on a bright red background consist of innumerable varieties, both naturalistic and geometric.

The slips, designs and fabric of the Rangmahal pottery is readily distinguishable from the Harappa, but from the existence of a few types common to both, it appears that the Rangmahal pottery, by a process of "atavism," which is not yet explained, inherited or imitated a few Harappan traits. On the other hand, some of its features persist in the present-day pottery of the Suratgarh-Anupgarh region.

Some of the sites of this culture are very extensive and a few of them have mud fortifications around them. Brickbats are plentiful on most of the sites, indicating the existence of brick houses. Other finds from the sites include terra cotta human and animal figurines, including painted bulls, faïence and shell bangles, a large number of beads of different shapes, etc.

That the culture flourished in the early centuries A.D. there is little doubt. This is borne out not only by one or two similar pottery types found in equivalent levels at Ahichchhatra, Hastinapur, Kausambi and other excavated sites, but by the discovery of one or two Kushan coins on the Bikanir sites. However, since some of the Rangmahal mounds are very high (35–40 feet), they must represent the accumulation of several centuries. That some sites also included the Gupta period is certain from the find in previous years of large-size terra cotta plaques with combined Gandhara and Gupta influence, of carved bricks and of a Gupta official seal which has been published. I found a sherd incised with 2 letters in late Gupta script.

In the Drishadvati Valley the Rangmahal culture persists, but, like the Harappan, in a somewhat modified form.

I have described the 3 main ancient cultures in a chronological order. However, an archæologist is not satisfied with the sequence of cultures unless established by stratigraphy. Accordingly, a few limited excavations were conducted during both seasons.

As stated above, the gray-ware people were fond of breaking new ground for themselves; this fact makes stratigraphic evidence hard to obtain. However, last year (1950), I had found 2 relatively representative mounds a few miles north of Anupgarh: one 8 feet high, representing the Harappa culture; and the other, 10 feet high, the gray ware. Their apexes were about 500 yards apart, although the washings of sherds from the respective sites almost commingled. These 2 mounds, the former called Tarkhanawala-Dera and the latter Chak 86, were also separated from each other by a canal and a road, which made continuous excavation impossible. Nevertheless, although direct stratigraphic evidence was clearly unobtainable, I made an attempt this year partially to excavate these mounds to obtain whatever stratigraphic clue was available about the sequence of these two cultures.

The results were satisfactory. For the excavation revealed that the Harappa and gray-ware cultures never came into contact with each other, at least in this particular area. The settlements of each originated, flourished and died out in its own time, entirely independently of the other.

However, a study of the natural soils carrying the settlements revealed certain data. On the Harappa side the occupation started on a natural sand deposit. After this, but before the site was deserted by the Harappans, there were 2 more clay deposits, due to river or rain action, after which the site was deserted.

Subsequently, there was again a third clay deposit, and it was on this that the initial gray-ware occupation at Chak 86 took place. It was, therefore, very clear that the gray-ware people came to the area later than its desertion by the Harappans. How much later remains unclear.

The incidental results of the excavation were that the Harappans, after occupying the site of their settlement for some time, built a mud-brick platform to carry their houses. Again, toward the close of their settlement, several pits were dug into the platform to receive urns containing the ashes and bones of the dead after cremation. One oblong cremation pit was also identified, in which 5 successive cremations had taken place, the remanié of each having been covered by clay or mud-bricks for the next cremation to take place.

For the sequence of the gray-ware and Rangmahal cultures, 2 sites were excavated:

a) A mound (18 feet) at Rer, situated about 15 miles to the northeast of Anupgarh, revealed successive layers of gray-ware occupation, superimposed by layers with most of the features of the Rangmahal culture, thus stratigraphically establishing the priority of gray ware to Rangmahal.

b) A smaller mound, further up, in Chak 40, confirmed the sequence, although the Rangmahal occupation here was more limited than at the prior gray-ware site.

Excavations thus confirmed the relative chronology of the 3 cultures, Harappa, gray ware and Rangmahal, in the explored part of the Sarasvati Valley. However, this may not be true elsewhere. For example, in the Drishadvati Valley, where gray ware seems to have a very much restricted distribution, the Harappa culture obtained in a modified form and might have lingered longer than in the more westerly regions. It might have been superseded there by the allied Rangmahal culture which flourished in the valley or even have symbiotically become mixed with it. This may explain not only why a few features of Harappa pottery are present in the Rangmahal sites, but much greater problems of the presence of a few Harappa culture elements in historical Hinduism.

All this remains conjectural at present, but is intended to emphasize that the problems of culture-sequence might not have been as simple as the Harappa culture being everywhere superseded by the gray ware one, or for that matter, of a pre-Aryan culture being ousted everywhere by the authors of the Vedas.

Surely, there were many more currents and crosscurrents in Indian history and much more complicated mingling as a result thereof than we now know. I am confident that further exploration in Brahamavarta and elsewhere will gradually unfold the unknown chapters of early Indian archæology and will duly supply the necessary corrective to history.

APPENDIX D: MANUSCRIPTS FROM FORT MAROT, CHOLISTAN, BAHAWALPUR

BY ABDUL-GHAFFAR [1]

DURING the Peabody Museum Expedition to West Pakistan, 1955, Dr. Henry Field was shown some manuscripts in the possession of the Headman at Fort Marot.

The following 8 documents (figs. 37–43, 89–96) have been translated:

A) I [Kandu Rahr] son of Sumrah son of Sawan son of Bahkar of the tribe of Chahchar [Jhajjar] Bahuhi, the resident of Qilah [Fort] Mirut, affidavit in the presence of Malik Aslam Shah Chowdhary of Parganah Fatehpur and Malik Jalaluddin Chowdhary that I on my own accord offer myself to the protector of Shariat Shah Ali Qadhi and Safar Ali for the services of dusting [tomb] of Shah Jamal Uddin and shall remain bound in the services of above-mentioned Mazar [tomb]. Whatever offerings i.e., goats, etc. come for martyrs will be handed over to above-mentioned Qadhi and I shall busy myself with prayer and shall not interfere with anything else. If Rahr and Chahchar [Jhajjar] arrive among the tribe of Bahuran, they will be treated with kindness.

Servant: Kandu Rahr, whatever stated above will be abided by.

Seals:

1. Qadhi Burhanuddin son of Sirajuddin in 979 H.
2. Shah Ali son of Shah Muhammad Qadhi.
3. Sheikh Shah son of Shah Muhammad Ali.
4. Chandar Bhan son of Bhagwan.

B) Be it known to officers charged with present and future administration of Pargana Qila Mirut in the Sarkar Subah Multan. Whereas in accordance with the Asnads of past rulers, the office of Qadha and appraiser was entrusted with Qazi Thana [ul-Haq] Quraishi and out of the revenue of the place, three Thankas were fixed as daily allowance of the above-mentioned person, therefore it is [imperative] that the above-mentioned person be considered as a permanent Qadhi of the place and in executing the law of Din [Faith] his hand be strengthened. None be made or considered his equal or partner. His daily allowance as of old practice be distributed to him every month out of the [income of] demarcated area, with a great care as a matter of rule this be put into practice.

Dated 4 Shaban, written in the 21 Regnal year. Bearing the seal of Alamgir Shah. [Murid Khan] and two others are not legible.

C) Be it known to officers and clerks charged with the present and future administration of Pargana Qilah Mirut Sarkar Subah Multan that in accordance with the firmans of previous Sultans and the Asnads of past Diwans, honoured and protector of Shariat Qadhi Safar Ali was entrusted with the offices of Qadha, appraising of prices, guardianship of congregational mosque, leading the prayers of Id and that with trust and righteousness, in conformity to law of Shariat, he would perform his duties; that he has been receiving regularly three Thankas in old coin out of the revenue of the area.
Therefore, it be strictly observed thar every month the fixed amount should go to above-mentioned Qadhi as before without fail, so that with this life-saving provision he be chained in his duties and that he disseminates peace and never goes beyond limit of Shariat with a great emphasis in this respect.

Written 15 Jamadi-ul-Thani, Year 35.

Seal of Alamgir Shah. Mukram Khan.

D) Back page of a document bearing endorsement of offices and the following seals:

1. Shah Alam Badshah Ghazi. Nasar Yar Khan.
2. Shah Alam Badshah Ghazi. Sadar Yar.
3. Muhammad Muizuddin Shahjadah 46. H.
4. Shahjadah Jahandar Shah.
5. Ali Khan.
6. Shah Alam. Rafiq.

E) Safar Ali, son of Shah Ali, reckoner and appraiser by inheritance in Qila Mirut, enquires of and summons witness from descendants of the Holy Prophet, Qadhis of Islam [Judges], landlords, officers in charge of expounding laws, the inhabitants of the locality and the money-lenders of Qila Mirut as to the fact that as officers of Qadha and reckoner and appraisership were in accordance with the firmans of previous Sultans and the Asnads of Khans, Amirs, residents of the Khanqah, landlords and the tenants of the above-mentioned Qilah entrusted with our family since the reign of Emperor of the day the protector of the faith and for long it is in the name of this humble self, the server of Shariat . . . and [I] have been performing duties with righteousness.

---

[1] Epigraphical Assistant, Department of Archæology, Karachi. With the assistance of Mohammed Idris Saddiqi, representative of the Department of Archæology, permission was obtained to photograph the greater part of these manuscripts. Mrs. Field photographed them through the windshield of the Jeep, since there was no plate of glass in the village and the manuscripts were split at the folds. (H.F.)

Merchants, traders, wayfarers to their way peacefully . . .

Mutawalliship of the congregational mosque, Friday services and Id prayers have been [regularly attended] . . .

Three Thankas allowance and one Bahluli on account of oil lamp for martyrs from the revenue receipt of the above-mentioned Pargana has been allotted . . . on the authority of the seal of Mirak Muinuddin, Sheikh Mohammed Amir, Mirza Abdul Latif, Mirza Mohammed Rahim, Syed Abdul Rahman, Khawaja Mir, Mirza Hatim Beg, Mir Haji, Mir Abdul Rahim, Mir Mohammed Shafi, Mohammed Ataullah Mirza Mohammed Munin . . . the past and present Diwan . . . and this allowance shall continue. Hope that in future in accordance with old practice six rupees every month be made available from the fund of Tenant Due Collector of the Pargana and Rs. 5 from the receipt of Id as a matter of tradition. Khadim of [Mazar] Shahid Jamal . . . should receive all that he used to get in past. None has any right to claim or interference in it.

Dated 1151.

Witnesses: Haibat Mardah and Maju Mardah.

Bearing the following seals:

1. Jagan Nath son of Gudhar Das.
2. Shahzada Muizuddin Mohammed Bahadur Shah.
3. Shahzada Jahandar Shah Badshah.
4. Alur Mal Jahandar Shah Badshah.

F) Confirmed that in accordance with the Asnads of previous rulers the refuge of Shariat [. . .] Qadhi Shah Ali and Murad Ali were granted daily allowance of three Thankas. The allowance of above-mentioned [be distributed regularly without fail] so that they busy themselves with prayers . . . With great emphasis in this respect it be put into practice.

Dated 10 Shaban, 28 Regnal year.

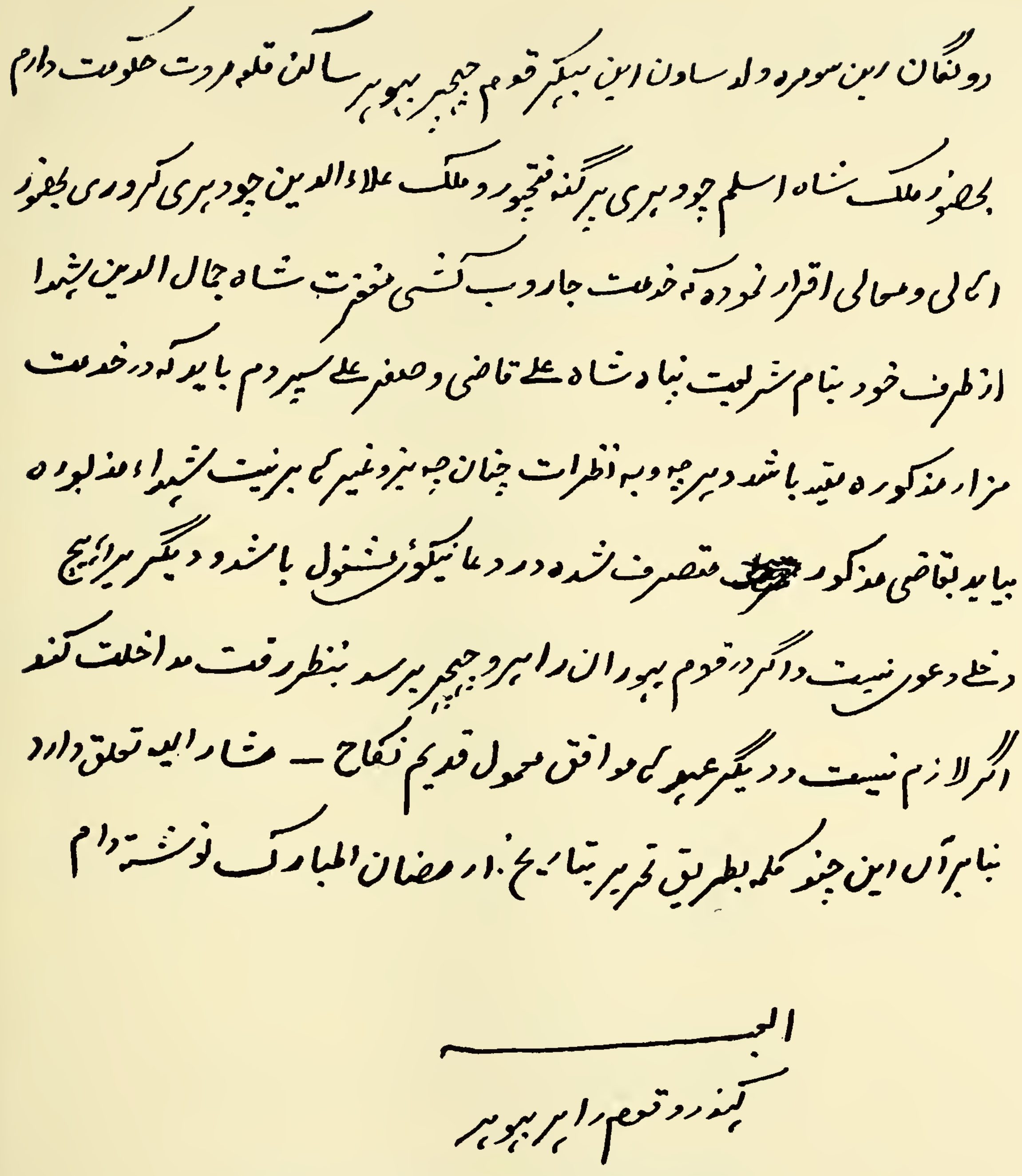
G) The mosque was erected in the reign of Jalaluddin Mohammed Akbar Badshah Ghazi by Mohammed Tahir, the ruler, at the instance of Syed Masrullah in Zilhijj, 976. H. There is no God but God, Mohammed is the messenger of God. Be it known to the officers and supervisor charged with the present and future administration of Pargana Qila Mirut that as the protector of Shariat Faqir Ali Qadhi is a great man . . .

Bearing the seal of Shah Alam Badshah Ghazi.

H) Humblest of the servants and the servant of Shariat, Shah Ali Qadhi of Qila Mirut enquires of and summons witnesses from the descendants of Holy Prophet, the judges of Islam, the landlords, expounder of law and all the influential people from among the residents of the above-mentioned Qila to the fact that the offices of Qadha in accordance with the firman of exalted highness were entrusted with the protector of Shariat late Qadhi Burhanuddin and the writing of the above-mentioned firman was eaten by worms although special seal [Emperor's] and that of the officers of His Highness still exists. . . . In accordance with previous firman [I still] hold offices of Qadha. The residents of Qila, wayfarers and merchants.

Bearing the following seals:

1. Shah Alam Badshah Ghazi, 1121.
2. Alamgir, Ghulam Syed, 1100.
3. Jahandar Shah, Fidvi Rafiq.
4. Jahandar Shah, Chowkidah.
5. Qasim Ali.
6. Jahandar Shah, Badshah, Fidvi Nasir.
7. Jahandar Shah, Mutha Ram, 1119.
8. Alamgir.



دو نگان ربن سومره ولد ساون ابن ببکر قوم جهجهر بهوهر ساکن قلعه مروت حکومت دارم

بحضور ملک شاه اسلم چودهری پرگنه فتحپور و ملک علاء الدین چودهری کروری بحضور

اهالی و موالی اقرار نموده که خدمت جاروب کشی مغفرت شاه جمال الدین شهدا

از طرف خود بنام شریعت پناه شاه علی قاضی و جعفر علی سپردم باید که در خدمت

مزار مذکوره مقید باشد و هر چه و به نظرات چنان چه نیز و غیر که بر نیت شهدا مذکوره

بیاید بقاضی مذکور [illegible] متصرف شده در دعا گوئی مشغول باشد و دیگر هرا هیچ

دخلی دعوی نیست و اگر در قدم بهوران راهبر و جهجهر برسد بنظر رفعت مداخلت کند

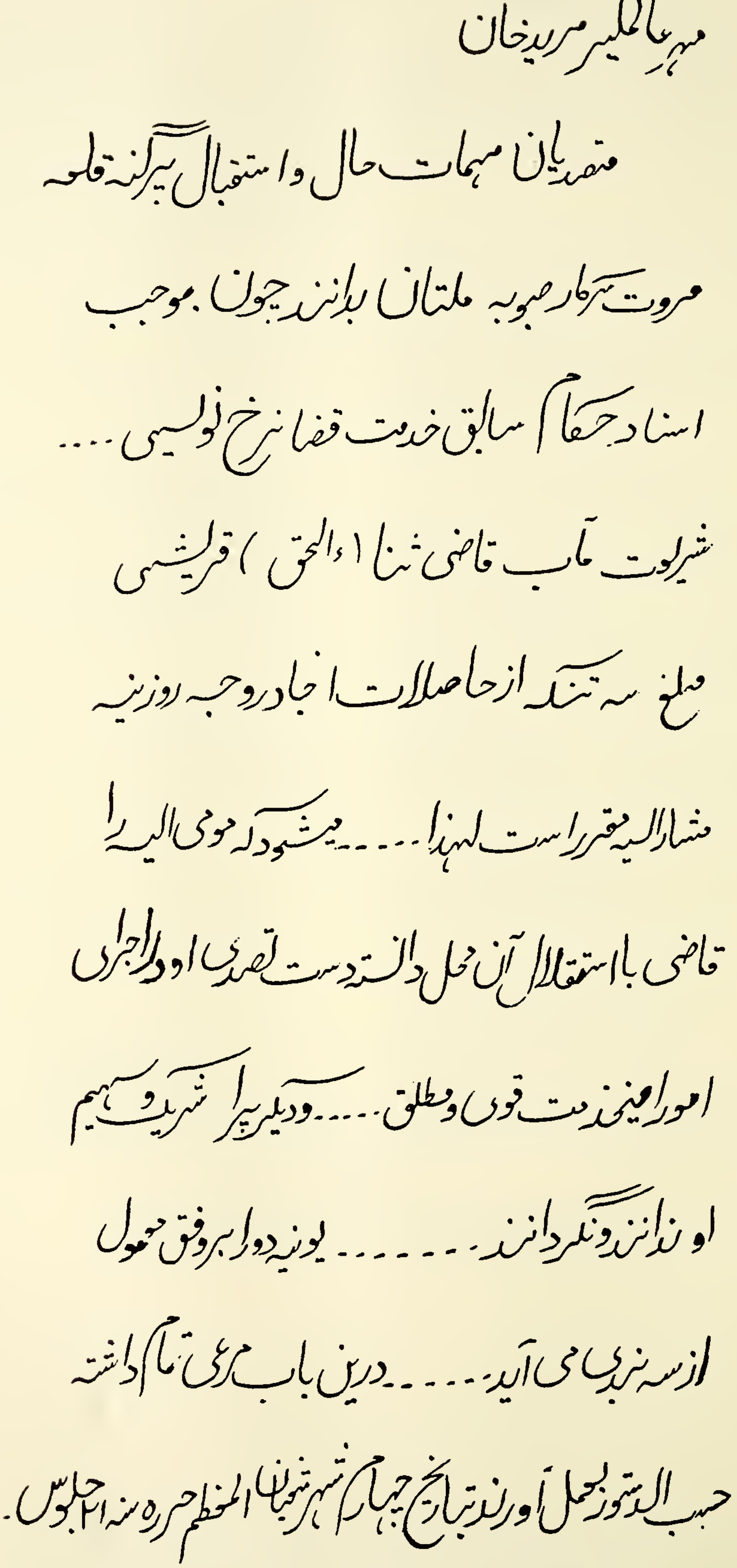
اگر لازم نیست در دیگر عهده که موافق معمول قدیم نکاح — مشار الیه تعلق دارد

بنا بر آن این چند کلمه بطریق تحریر بتاریخ ۱۰ رمضان المبارک نوشته دادم

العبد

کنندرو نعم راهبر بهوهر

Fig. 37. Manuscript from Fort Marot, Bahawalpur.



مهر عالمگیر مرید خان

متصدیان مهمات حال و استقبال پرگنه قلعه

مروت سرکار صوبه ملتان بدانند چون بموجب

اسناد حکام سابق خدمت قضا نرخ نویسی ....

شریعت مآب قاضی ثنا (ء الحق) قریشی

مبلغ سه تنکه از حاصلات اجاد وجه روزینه

مشار الیه مقرر است لهذا .... میشود که مومی الیه را

قاضی باستقلال آن محل دانسته دست تصدی او در اجرای

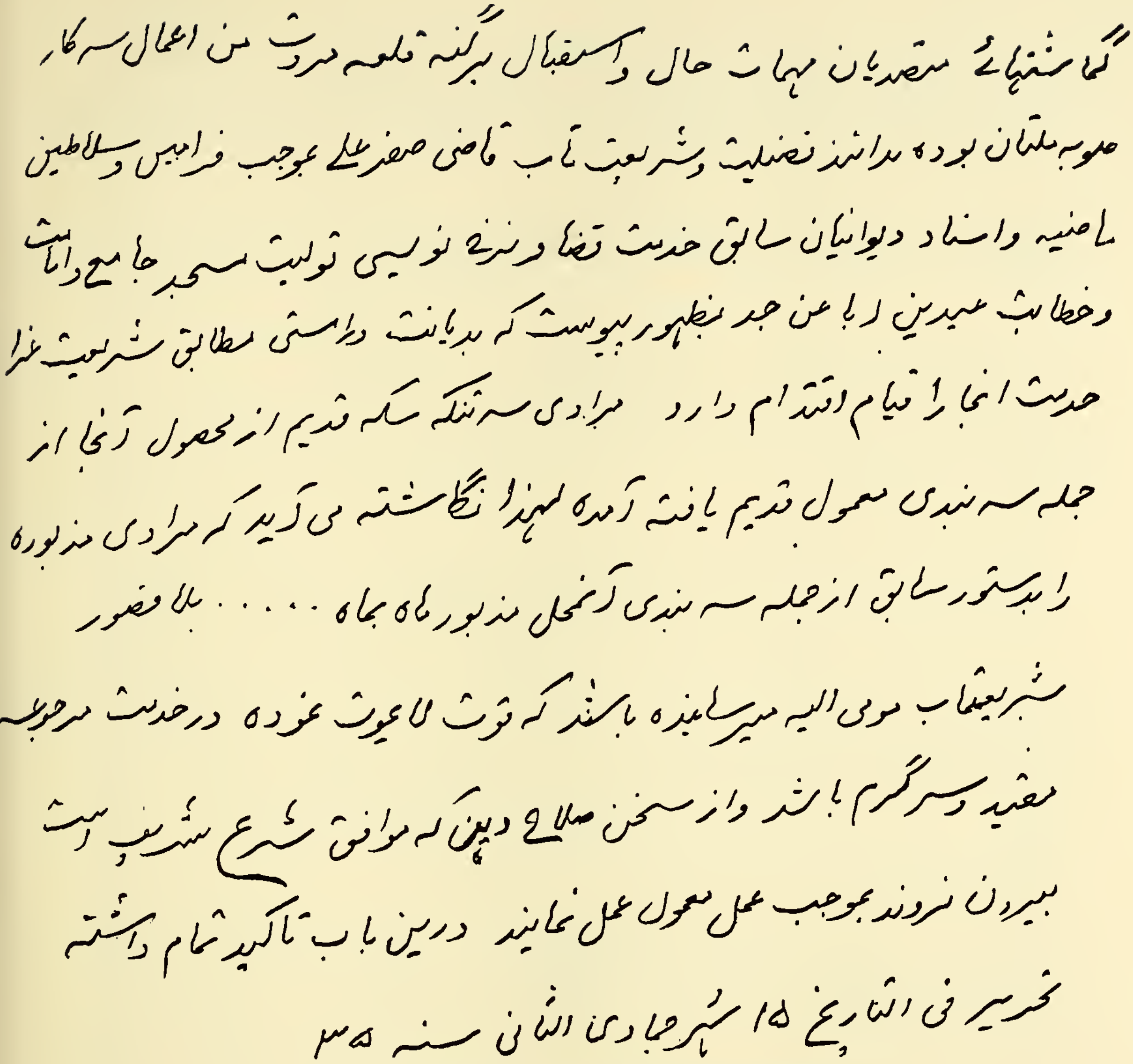
امور امین خدمت قوی و مطلق .... و دیگری را شریک و سهیم

او ندانند و نگردانند .... یومیه دوا بر وفق معمول

از سه نبری می آید .... درین باب مرعی تمام داشته

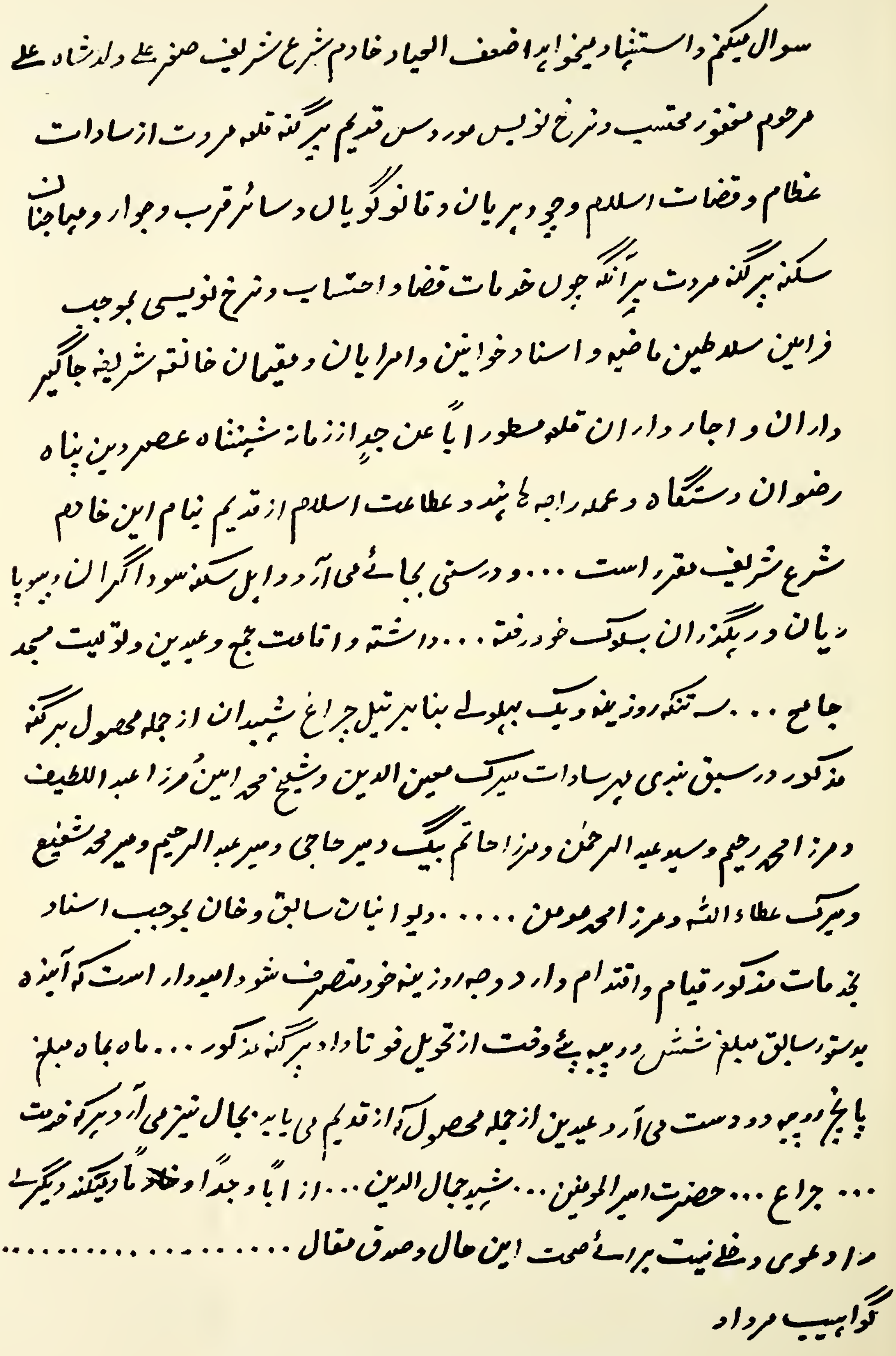
حسب الدستور العمل آورند بتاریخ چهارم شهر شعبان المعظم حرره سنه ۲۱ جلوس.

Fig. 38. Manuscript from Fort Marot, Bahawalpur.



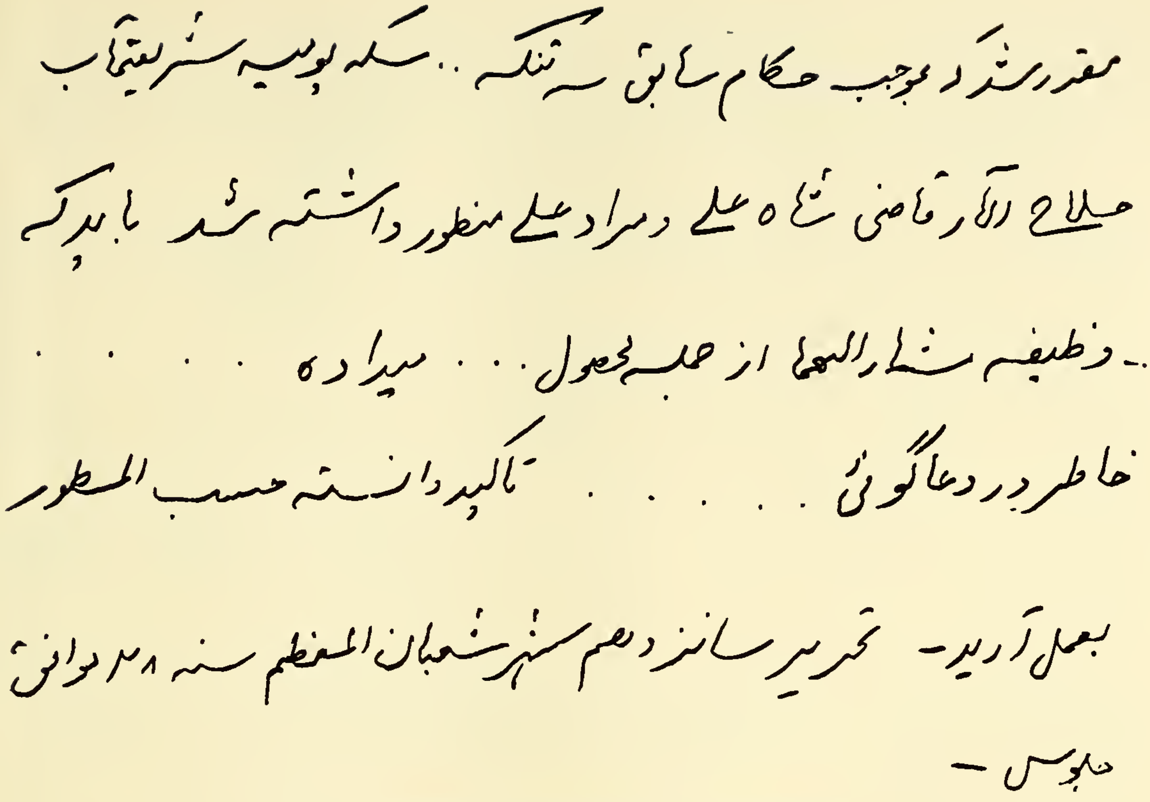
گماشتهای متصدیان مهمات حال و استقبال پرگنه قلعه مروت من اعمال سرکار
صوبه ملتان بوده بدانند فضیلت و شریعت مآب قاضی صفدر علی بموجب فرامین سلاطین
ماضیه و اسناد دیوانیان سابق خدمت قضا و نرخ نویسی تولیت مسجد جامع و امامت
و خطابت عیدین را عن جد بظهور پیوست که بدیانت و راستی مطابق شریعت غرا
خدمت انجا را قیام اقتدام دارد مرادی سه تنکه سکه قدیم از محصول آنجا از
جمله سه بندی معمول قدیم یافته آمده لهذا نگاشته می آید که مرادی مذکوره
را بدستور سابق از جمله سه بندی آنمحل مذکور ماه بماه ..... بلا قصور
شریعتماب موی الیه میرسانیده باشند که قوت لایموت نموده در خدمت مرجوعه
مستعد و سرگرم باشد و از سخن صلاح دین که موافق شرع شریف است
بیرون نروند بموجب عمل معمول عمل نمایند درین باب تاکید تمام داشته
تحریر فی التاریخ ۱۵ شهر جمادی الثانی سنه ۳۵

Fig. 39. Manuscript from Fort Marot, Bahawalpur.



سوال میکنم و استشهاد میخواهد اضعف العباد خادم شرع شریف صفدر علی ولد شاه علی
مرحوم مغفور محتسب و نرخ نویس موروثی قدیم پرگنه قلعه مروت از سادات
عظام و قضات اسلام و چودهریان و قانونگویان و سائر قرب و جوار و مهاجنان
سکنه پرگنه مروت برآنکه چون خدمات قضا و احتساب و نرخ نویسی بموجب
فرامین سلاطین ماضیه و اسناد خوانین و امرایان و مقیمان خانقه شریفه جاگیر
داران و اجاره داران قلعه مسطور اباً عن جدٍ از زمانه شهنشاه عصر دین پناه
رضوان دستگاه و عهد راجهای هند و عطاعت اسلام از قدیم بنام این خادم
شرع شریف مقرر است . . . و درستی بجائی می آرد و اهل سکنه سوداگران و بیوپاریان
و رهگذران بسلوک خود رفته . . . داشته و اقامت جمع و عیدین و تولیت مسجد
جامع . . . به تنکه روزینه و یک بهلولی بنابر تیل چراغ شهیدان از جمله محصول پرگنه
مذکور در سبق بندی بمهر سادات میرک معین الدین و شیخ محمد امین و میرزا عبد اللطیف
و میرزا احمد رحیم و سید عبد الرحمن و میرزا حاتم بیگ و میر حاجی و میر عبد الرحیم و میر محمد شفیع
و میرک عطاء الله و میرزا احمد مومن . . . . . دیوانیان سابق و حال بموجب اسناد
بخدمات مذکور قیام و اقدام دارد و وجه روزینه خود متصرف شود امیدوار است که آینده
بدستور سابق مبلغ شش روپیه بوقت از تحویل فوتاداد پرگنه مذکور . . . ماه بماه مبلغ
پانج روپیه دو دست می آرد عیدین از جمله محصول که از قدیم می یابد بحال نیز می آرد و هر که خدمت
. . . چراغ . . . حضرت امیر المومنین . . . شهید جمال الدین . . . از اباً و جداً و ~~خلا~~ ما دیکنند دیگری
مزاحم و دخلی نیست برای صحت این حال و صدق مقال . . . .
گواهیست مرداد

FIG. 40. Manuscript from Fort Marot, Bahawalpur.



مقرر شد بموجب حکام سابق سه تنکه .. سکه بودیه شریعت مآب

صلاح آثار قاضی شاه علی و مراد علی منظور داشته شد باید که

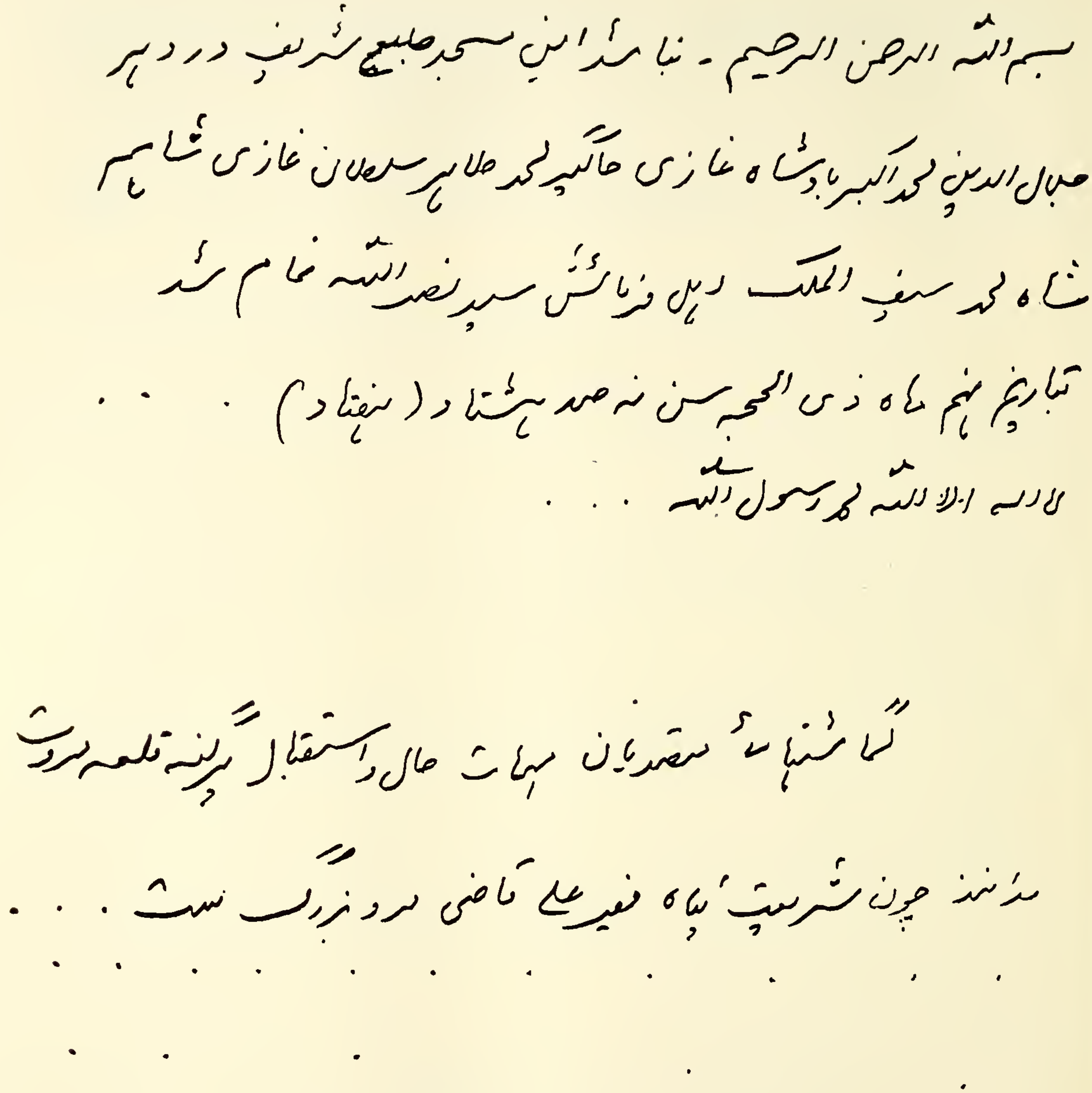
وظیفه مشار الیهما از جمله محصول .. میداده . . . . .

خاطر در دعاگوئی . . . . تاکید دانسته حسب المسطور

بعمل آرید - تحریر سانزدهم شهر شعبان المعظم سنه ۲۸ موافق

جلوس -

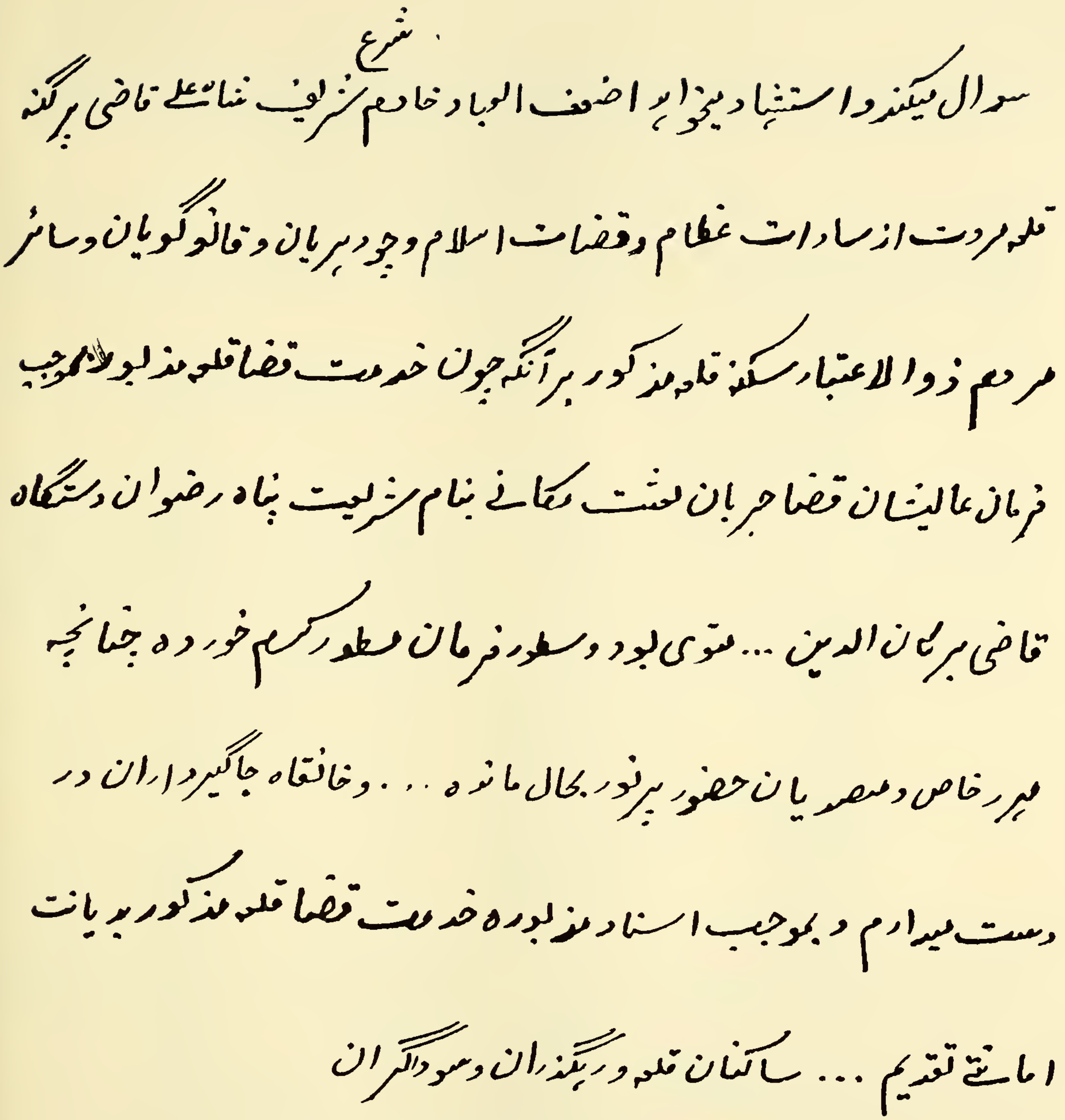
Fig. 41. Manuscript from Fort Marot, Bahawalpur.



بسم الله الرحمن الرحیم ـ بنا شد این مسجد جامع شریف در دهر
جلال الدین محمد اکبر بادشاه غازی جاگیر محمد طاهر سلطان غازی شاهم
شاه محمد سیف الملک راه فرمایش سید نصر الله تمام شد
بتاریخ پنجم ماه ذی الحجه سن نه صد هشتاد (هفتاد) . .
لا اله الا الله محمد رسول الله . . .

گماشتهای متصدیان مهمات حال و استقبال گیرنده قلعه مروت
بدانند چون شریعت پناه فقیر علی قاضی مرو بزرگ نیست . . .
. . . .
. . . . .

Fig. 42. Manuscript from Fort Marot, Bahawalpur.



شرع
سوال میکنند و استفتا مینمایند اضعف العباد خادم شریف غنا علی قاضی پرگنه
قلعه مروت از سادات عظام و قضات اسلام و چودهریان و قانونگویان و سائر
مردم ذوالاعتبار سکنه قلعه مذکور بر آنکه چون خدمت قضا قلعه مذکور بموجب
فرمان عالیشان قضا جریان نعمت مکانی بنام شریعت پناه رضوان دستگاه
قاضی برهان الدین ... مفوض بود و سطور فرمان مسطور رسم خورده چنانچه
مهر خاص و مصدیان حضور پرنور بحال مانده ... و خانقاه جاگیرداران در
دست میدارم و بموجب اسناد مذکوره خدمت قضا قلعه مذکور بدیانت
امانت تقدیم ... ساکنان قلعه و رهگذران و سوداگران

Fig. 43. Manuscript from Fort Marot, Bahawalpur.

APPENDIX E: REPTILES AND AMPHIBIANS COLLECTED BY THE EXPEDITION IN SAUDI ARABIA AND IN BALUCHISTAN AND BAHAWALPUR, WEST PAKISTAN

BY ARTHUR LOVERIDGE

(Museum of Comparative Zoology, Harvard)

THE following specimens were collected by Dr. and Mrs. Henry Field during the Peabody Museum Expedition, 1955, in Saudi Arabia, Makran and Kalat in Baluchistan and in Sind.

	Nos.	*Locality*[2]	*Date*
LIZARDS[1]			
Gymnodactylus k. kachensis Stoliczka	54410	Tatta	8.iii.55
Hemidactylus flaviviridis Ruppell	54409	Turbat	21.iii.55
Agama agilis Olivier	54413	Quetta	7.iv.55
	54414	Saradoo	27.iii.55
	54415	Kalat	21.iii.55
	54416-20	Nag	30.iii.55
Agama caucasica (Eichwald)	54411	Little Kapoto	4.iv.55
Agama melanura (Blyth)	54412	Big Kapoto	4.iv.55
Calotes versicolor (Daudin)	54421	Nag	30.iii.55
Phrynocephalus scutellatus (Olivier)	54422-9	Nag	30.iii.55
	54430-3	Saradoo	27.iii.55
Acanthodactylus c. cantoris Gunther	54438-9	Nag	30.iii.55
[3] *Acanthodactylus micropholis* (Blyth)	54440	Nag	30.iii.55
	54434-5	Saradoo	27.iii.55
Eremias guttulata watsonana Stoliczka	54436	Saradoo	27.iii.55
	54437	Nag	30.iii.55
[3] *Eumeces schneideri zarudnyi* Nikolski	54443	Turbat	21.iii.55
	54444	Saradoo	27.iii.55
Mabuya macularia (Blyth)	54446	Tatta	8.iii.55
Ophiomorus tridactylus (Blyth)	54445	Saradoo	27.iii.55
SNAKES			
Coluber ventromaculatus Gray and Hardwicke	54401	Tatta	8.iii.55
Natrix p. piscator (Schneider)	54402	Tatta	8.iii.55

---

[1] At Al Uqair, south of Dhahran, Saudi Arabia, Dr. Field collected on February 21 two geckos (*Alsophylax blanfordii*).

[2] All localities, except for Tatta in Sind, are in Makran and Kalat in Baluchistan. Some specimens in Baluchistan were collected by Naeem Beg Chugtai; others by Hasham.

[3] Species new to the Museum of Comparative Zoology.

SNAKES (*Continued*)

	Nos.	*Locality*	*Date*
Ptyas mucosus (Linnaeus)	54403	Tatta	8.iii.55
Psammophis leithii Gunther	54406	Kapoto	5.iv.55
Naja naja oxiana	54404	Tatta	8.iii.55
Echis c. pyramidum (Geoffroy)	54405	Tatta	8.iii.55
FROGS			
Rana cyanophlyctis Schneider	28432-5	Panjgur	28.iii.55
	28436-9	Turbat	21.iii.55
	28440-3	Tatta	8.iii.55
Rana limnocharis Wiegmann	28444	Tatta	8.iii.55
Rana tigerina Daudin	28445-6	Tatta	8.iii.55
[8] *Rana sternosignata* Murray	28447-50	Kalat	3.iv.55

ADDENDA

A) On March 15, 1955, the following snakes were purchased from Hasham, professional snake charmer at Tatta near the Indus River in Sind. They were shipped alive by air to the Zoological Society of London, where they were welcomed as a gift on May 27. Mr. L. C. Bushby sent the following identifications:

No.	*Common Name*	*Latin Name*	*Length*
1	John's sand boa	*Eryx johni*	3′1″
1	Fishing snake	*Natrix piscator*	4′1″
3	Diadem snake	*Coluber zamenis diadema*	5′11″; 4′10″; 4′6″
3	Gray's rat snake	*Coluber ventromaculatus*	3′0″, 2′7″; 2′0″
1	Common Indian cat snake	*Boiga trigonata*	2′1″
1	Leith's snake	*Psammophis leithi*	2′3″
4	Carpet vipers	*Echis carinatus*	2′3″; 1′11″; 1′8″; 1′6″

B) Prior to leaving Karachi, Dr. and Mrs. Field presented to Dr. A. A. Quraishy, Curator of the Karachi Zoo in Gandhi Gardens, the following single specimens:

Specimen	*Locality*
Varanus bengalensis	Shahi-Tump near Turbat, Makran
Trionyx gangeticus	Tatta in Sind
Testudo horsfieldi	Makran, Baluchistan
Clemmys caspica caspica	Al Uqair, south of Dhahran, Saudi Arabia

Appendix F: SHELLS COLLECTED BY THE EXPEDITION

BY FRITZ HAAS

(Chicago Natural History Museum)

THE FOLLOWING specimens were sent to Chicago Natural History Museum for identification:

1) At Al Uqair near the coast of the Persian Gulf about 35 miles south of Dhahran on a chain of low mounds covered with sherds and other evidence of human occupation the following 6 species were collected by Dr. and Mrs. Henry Field while guests of the Arabian-American Oil Company (ARAMCO):

Mitrella (*Mitrella*) *blandi* (Sowerby)
Erosaria (*Erosaria*) *turdus* (Linné)
Clypeomorus clypeomorus (Jousseaume)
Chicoreus (*Chicoreus*) *anguliferus* (Lamarck)
Thalotia (*Thalotia*) *kotschyi* (Philippi)

In company of these typically marine shells were rather large quantities of the freshwater species *Melanoides* (*Melanoides*) *tuberculata* (Müller). These were collected about 1,000 paces inland above a small wadi. The bulk of the material is fossil, although of rather recent age. Part of the shells were cemented together to form a stratum.

2) At Al Juzayir, 6 miles south of Zallaq on the west coast of Bahrain Island, Dr. Field collected the following near the shoreline on a low midden:

Arca (*Barbatia*) *fusca* Bruguière
Pteria (*Pinctada*) *inflata* (Schumacher)
Laevicardium (*Trachycardium*) *flavum* (Linné)
Pitar (*Paradione*) *nivea* (Hanley)
Gafrarium (*Circe*) *scriptum* (Linné)
Codakia (*Jagonia*) *fibula* (Reeve)
Diodora funiculata (Reeve)
Thalotia (*Thalotia*) *kotschyi* (Philippi)
Clypeomorus clypeomorus Jousseaume
Lemintina decussata (Gmelin)
Mitrella (*Mitrella*) *blanda* (Sowerby)
Drupa (*Morula*) *concatenata* (Lamarck)
Chicoreus (*Chicoreus*) *anguliferus* (Lamarck)

3) At Kher al-Udaid on Qatar Peninsula Mr. Don Holm, ARAMCO geologist, collected the following species:

Dentalium (*Dentalium*) *lineolatum* Cooke
Dentalium (*Dentalium*) *shoplandi* Jousseaume
Dentalium (*Dentalium*) *aratorum* Cooke
Arca (*Barbatia*) *fusca* Bruguière
Glycymeris (*Pectunculus*) *pectiniformis* (Lamarck)
Spondylus aculeatus Chemnitz
Laevicardium (*Trachycardium*) *flavum* (Linné)
Pitar (*Paradione*) *nivea* (Hanley)
Lucina (*Lucina*) *edentula* (Linné)
Codakia (*Jagonia*) *fibula* (Reeve)
Diodora funiculata (Reeve)
Trochus (*Infundibulops*) *erythraeus* Beck
Umbonium (*Umbonium*) *vestiarium* (Linné)
Melanoides (*Melanoides*) *tuberculata* (Müller)
Clypeomorus clypeomorus Jousseaume
Chicoreus (*Chicoreus*) *anguliferus* (Lamarck)
Mitrella (*Mitrella*) *blanda* (Sowerby)
Bullaria (*Bullaria*) *ampla* (Linné)

In this series *Melanoides* (*Melanoides*) *tuberculata* also occurs thus indicating fresh water in this area.

These specimens form welcome additions to the Museum collections from the Persian Gulf.

4) On March 20, 1955, six miles southwest of Pasni, the port of Makran, Dr. and Mrs. Henry Field collected the following list of marine species. Two of them were not in such a state of preservation that their classification could be made beyond doubt; these are marked with a query.

Lioconcha semiarata (Dunker)
Lioconcha callipyga (Born)
Cellana rota (Gmelin)
Turbo (*Lunella*) *coronatus* Gmelin
Polinices (*Polinices*) *aurantia* (Lamarck)
Purpura (*Purpura*) *bufo* Lamarck
? *Mytilus* (*Chloromya*) *perna* Linné
? *Ostrea* (*Crassostrea*) *margaritacea* Lamarck

In addition, across Baluchistan from Pasni to Kalat, great numbers of one species of land shells were collected:

Zootecus insularis chion (Pfeiffer).

APPENDIX G: INSECTA COLLECTED BY THE EXPEDITION

BY W. L. BROWN, JR.
(Museum of Comparative Zoology, Harvard)

DURING the traverse across former Baluchistan from Pasni to Quetta, Dr. Henry Field collected the following Insecta.

The ants, while for the most part fairly well-known species, have not all been collected previously in this region. In some cases, a very significant range extension is indicated, and for this reason we are particularly glad to have this collection.

HYMENOPTERA

FORMICIDAE

Messor arenarius (*Fabricius*)

SAUDI ARABIA: Al Uqair, 30 miles south of Dhahran, on coast opposite Bahrain Island.

Large black harvester.

Messor sp.

MAKRAN: Nag.

KALAT: Between Little and Big Kapoto, 10 miles south of Kalat town; Mastung cultivated area.

Smaller black species indeterminate in the present taxonomic state of this large and difficult genus.

Monomorium indicum *Forel*

MAKRAN: Nodiz.

KALAT: Low hill between Little and Big Kapoto, 10 miles south of Kalat town.

SIND: Tatta.

A very small reddish harvester with brownish head and black gaster.

Crematogaster auberti *Emery*

MAKRAN: Turbat.

A few workers.

SIND: Tatta.

A small worker, probably of this species.

Acantholepis sericea *Forel*

MAKRAN: Nodiz.

SIND: Tatta.

Small, quick-moving, red-and-black species.

Camponotus sp.

MAKRAN: Pasni.

This large black species is one I have not seen before, and it may well be undescribed. This genus, however, contains over 1,500 named forms, many of which are synonyms, and the general taxonomy is chaotic. I can make no decision until I know more about the Old World *Camponotus.*

Cataglyphis setipes *Forel*

MAKRAN: Pasni, Nodiz, Panjgur Oasis, Nag and Jangal.

KALAT: Mastung cultivated area.

SIND: Tatta.

This is a large, fast-running, red-and-black species taken at nearly every stop during the 500-mile traverse from Pasni to Quetta.

Cataglyphis aenescens (*Nylander*)

MAKRAN: Dry bed of the Rakhshan River at Nag.

A smaller, darker relative of *C. setipes* Forel.

MUTILLIDAE

Apterogyna sp.

MAKRAN: Turbat. Male.

HEMIPTERA

LYGAEIDAE

Lygaeus sp.

MAKRAN: Turbat.

COLEOPTERA

TENEBRIONIDAE

2 or 3 genera—Indeterminate.

MAKRAN: Nag.

KALAT: Near Big Kapoto; Mastung.

SCARABAEIDAE

Onthophagus ? sp.

MAKRAN: Nag.

MELOLONTHINAE

SAUDI ARABIA: Al Uqair, 30 miles south of Dhahran on coast opposite Bahrain Island.

STAPHYLINIDAE

Paederus sp.

MAKRAN: Turbat.

MYRIOPODA

Scolopendridae

Scolopendra morsitans *Linn.*

Saudi Arabia: Al Uqair, 30 miles south of Dhahran, on coast opposite Bahrain Island.

SCORPIONIDAE

Buthidae

Buthus sp.

Sind: Tatta.

APPENDIX H: INSECTS OF BALUCHISTAN AND THEIR DISTRIBUTION

BY NAZEER AHMED JANJUA[1]

ZOOGEOGRAPHICALLY, Baluchistan is situated in the Palæarctic region, separated from the Oriental part of the Indo-Pakistan area by an ill-defined line following the course of the Indus River. The Sibi District of Baluchistan appertains to the plains of West Pakistan and here occurs the western limit of the Oriental Zone, the Bolan and the Sulaiman ranges constituting a primary fauna border. The insects of Baluchistan belong primarily to the Iranian division of the Palæarctic zone, but there is also an infiltration of the Oriental species.

Owing to Baluchistan's isolation from other parts of the Indo-Pakistan region, together with lack of communications, the insect fauna had been little explored. With the establishment of the Central Agricultural Department of the late Government of India at the beginning of the twentieth century, investigations were started on the insects of the Indo-Pakistan region, particularly of economic importance, but little attention was paid to those of Baluchistan.

One of the earliest collectors of insects in Baluchistan was Colonel Charles Swinhoe, who collected a good number of Lepidoptera during his field service from 1880–81. His collection was examined by Butler (1881–83). Later, Swinhoe (1885) published an up-to-date list of insects of Baluchistan, including those collected by previous workers. Excluding the species of Afghanistan, he reported 72 species from Baluchistan, of which a few were of economic importance.

During the same year Dr. J. E. T. Aitchison (1887), a naturalist attached to the Afghan Delimitation Commission, made a good zoological collection, including about 25 species of insects from the northwestern part of Baluchistan. Murray, who traveled through Baluchistan and southern Afghanistan, listed 100 Lepidoptera from Baluchistan, a good number of economic importance; the majority had already been described by previous collectors.

After 1890, when Quetta became an important military center, some of the British Officers began to collect Insecta either as a hobby or by request or in addition to their primary duties. Colonel C. G. Nurse (1907), who published a preliminary account of the insects of Quetta and Pishin, reported species belonging to some of the important Orders. Nurse, who had devoted his attention to Hymenoptera, described about 100 new species from Baluchistan. Most of the Nurse collection, which remained undescribed, was worked out by Cameron (1904–1906) who added about 90 more species from Baluchistan.

In 1907, the Baluchistan Natural History Society was formed; this functioned until 1927. Whereas the Society made a valuable contribution in collecting the other fauna of Baluchistan, very few insects were recorded and these comprised hardly 50 species which had already been recorded by previous collectors (Cummings, 1934).

Swinhoe (1885) recorded 43 species of butterflies from Baluchistan and Evans (1932) increased the number to 108, some of which included new species.

Some records have also been made by Cleghorn (1914), Cotes (1891), Stebbing (1905, 1907 and 1914), Nurse (1907), Das (1918), Gardner (1927 and 1944), Laing (1931), Cummings (1934), Pruthi (1935 and 1938) and Rao (1939) on species of economic importance in Baluchistan. For additional references the series of volumes in "The Fauna of British India" should be consulted.

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[1] Former Deputy Director (Technical), Department of Plant Protection, Karachi. Minor editorial revisions have been made to conform to our style. Dr. Janjua died recently in Karachi. For this reason I asked Dr. P. J. Darlington, Jr., Curator of Insects, Museum of Comparative Zoology, Harvard University, and Dr. W. T. M. Forbes to check the spellings of the Coleoptera and Lepidoptera respectively. Dr. Forbes called attention to the fact that Nos. 303–304 should follow No. 247. The use of parentheses has not been checked with the original sources, but is believed to be approximately correct. Attention is called to the references listed under Taskhir Ahmad, Janjua and to W. H. Evans (1932) where he lists 108 species of Lepidoptera from Baluchistan. The tables have not been indexed. (H.F.)

With the reorganization of the Baluchistan Agricultural Department in 1932 and with the establishment of the Entomological Section, a survey of the Insecta was begun. As a result, an account of some of the important species of economic importance was published by Janjua (1938, 1939, 1940, 1942, 1950, 1952, 1954, 1955 and 1956), Mustafa and Janjua (1942), Janjua, Mustafa and Samuel (1943), Janjua and Nasir (1947a, b), Janjua, Mustafa and Khan (1947), Janjua and Mehra (1949), and Janjua, Nasir and Qureshi (1954).

The writer has been engaged in this work since 1932 and, at first, attention was mainly paid to species of economic importance. Investigations were mainly directed to find out the distribution, nature and extent of damage, food plants and life and seasonal histories of the important pests, a list of which is recorded in Section A. Together with the species of economic importance, a general survey of the insect fauna of Baluchistan was also undertaken and a list of the species so far recorded is given in Section B. The identification of the species has been made by: the Imperial Entomologist, now Head of the Division of Entomology, Indian Agricultural Research Institute, New Delhi; Forest Entomologist, Dehra Dun; and the Commonwealth Institute of Entomology, London. To all of these the writer is grateful for the help given.

It has further been ascertained that most of the insects, particularly species of economic importance in Baluchistan, have been introduced from Afghanistan.

As a direct result of a long-time policy of the unrestricted importation of plants and many plant products from Afghanistan, several pests such as the codling moth (*Cydia pomonella* Linn.), *Euzophera punicella* Moore, *Hyponomeuta padella* Linn., *Euproctis signata* Blan., etc., some of which are not found in the Indo-Pakistan region, have become firmly established in Baluchistan.

Janjua (1938) recorded the codling moth as a serious apple pest in Kandahar; subsequently, Taskhir Ahmad (1940, 1946) found this moth seriously damaging apples, quinces, etc., throughout the fruit-growing area of Afghanistan. In view of the nature of the life-history of the pest, the most common mode of its spread from one place to another is through the transport of infested fruit and the packing material.

During the past half century, apples from Kandahar have been coming in regularly and obviously the infested fruit and packing material contained codling moth larvae in them and the pest, finding climatic conditions and host plants ideal for its propagation in Baluchistan, gradually established itself and is now a pest of first rate importance. In other parts of the Indo-Pakistan region, the pest is found only in the Parachinar District of the North-West Frontier Province of West Pakistan which is also adjacent to Afghanistan and most probably there the pest has also been introduced from that country (Pruthi and Batra, 1938). It is therefore believed that the codling moth has been introduced from Afghanistan into Baluchistan.

In the Indo-Pakistan region, *Euzophera punicella* Moore is so far confined only to Baluchistan, where it was first recorded in 1890 from pomegranates sent by Cleghorn to Calcutta (Cotes, 1891). It has subsequently been recorded as a serious pest of pomegranates, being found throughout Baluchistan (Janjua, 1942b). It had also been observed as a serious pest in Afghanistan by Taskhir Ahmad (1940, 1946). An examination of the infested fruit from Afghanistan during recent years has shown that this pest in introduced on pomegranates in very large numbers; about 60 per cent of the fruit is infested and invariably 2–5 larvae are present in a single fruit (Janjua and Nasir, 1947a).

Like the codling moth, the mode of the spread of this pest from one place to another is also through the transport of infested fruit and its packing material. For a very long time, even before the importation of apples started, pomegranates from Afghanistan had been coming in regularly and, obviously, the larvae of this pest contained in the infested fruit slowly established themselves in Baluchistan. It has further been observed that the percentage of infestation is more in the Quetta-Pishin District as compared to other parts of the Province as the supply of fruit from Afghanistan is always received first in this district. It is thus certain that *Euzophera punicella* Moore has also been introduced into this province from Afghanistan.

Similarly, *Hyponomeuta padella* Linn., which is a serious pest in Afghanistan where its larvae defoliate apple and other fruit trees (Taskhir Ahmad, 1940, 1946), is present in Baluchistan and does not occur in any other parts of the Indo-Pakistan region. Considering the life history of the insect, the mode of spread from one place to another is through nursery plants which carry the hibernaculae on branches and twigs. Nursery plants have been coming from Afghanistan for a very long time. Examination of some nursery plants imported from Afghanistan has revealed the presence of hibernating larvae on them and the view that the pest has been introduced into Baluchistan from that country is thus confirmed.

Euproctis signata Blan. is another example. Examination of the various weeds and grasses used in packing fresh fruit imported from Afghanistan has shown the presence of the larvae and egg masses of this pest in them. Some overwintering larvae have also been detected coming along with the nursery plants. In Baluchistan, the pest is, so far, confined to the Quetta-Pishin District and it is very probable that this insect has only recently been introduced.

The Wheat Bug (*Eurygaster maura* Linn.), a pest of the Palæarctic regions and known to damage wheat and other cereals in the Middle East (Syria, Iraq, Iran, etc.) and in Central Europe and Transcaspia in southern Russia (Sorauer, 1932), is fairly common in the northeastern parts of Baluchistan. During recent years this has become a serious pest to wheat and other crops in that area (Janjua, Mustafa and Khan, 1947). According to Pruthi (1943), it is probable that this pest also occurs in Afghanistan. The common mode of the spread of this pest is through the flight of the adults. In Baluchistan it was first reported during 1937 from the Upper Zhob Valley adjacent to Afghanistan and since then has spread to other parts of the Province. It is, therefore, probable that this has also been introducted from Afghanistan.

It will thus be seen that a good number of the pests, particularly the Palæarctic species, so common in Baluchistan, have been introduced from Afghanistan either through fresh or dry fruits, nursery plants or weeds and grasses used for packing, or through the various commodities imported regularly from that country.

SECTION A: INSECTS OF ECONOMIC IMPORTANCE RECORDED FROM BALUCHISTAN

No.	*Insect Pest*	*Food Plants*	*Damage*	*Habitat*
		ORTHOPTERA		
Acrididae				
1.	*Calliptamus italicus* Linn.	All kinds of vegetables, potatoes, tobacco, lucerne, wheat, jowar and maize. Nursery plants, particularly almond and apple.	Sometimes serious	Throughout uplands; more serious from 3,500–6,000 feet.
2.	*Calliptamus siculus* Burm.	All kinds of vegetables, potatoes, tobacco, lucerne, wheat, jowar and maize. Nursery plants, particularly almond and apple.	Sometimes serious	Throughout uplands; more serious from 3,500–6,000 feet.
3.	*Schistocerca gregaria* Forsk.	All kinds of crops and vegetation.	Serious	Throughout Province, particularly in desert areas.
4.	*Locusta migratoria* Reich.	All kinds of crops and vegetation.	Minor	Throughout Province, particularly in desert areas.
5.	*Sphingonotus montanus* Motsch.	All kinds of vegetables and crops. Nursery plants, particularly almond and apple.	Minor	Throughout uplands; more common from 3,500–6,000 feet.
6.	*Sphingonotus balteatus balucha* Uv.	All kinds of vegetables and crops. Nursery plants, particularly almond and apple.	Minor	Throughout uplands; more common from 3,500–6,000 feet.
7.	*Sphingonotus gigas* Kirby	All kinds of vegetables and crops. Nursery plants, particularly almond and apple.	Minor	Throughout uplands; more common from 3,500–6,000 feet.
8.	*Catantops annexus* B.	Some crops and vegetable seedlings.	Minor	Throughout Province.
9.	*Cyrtacanthacris ranacea* Stoll.	Almost all crops and vegetable seedlings.	Minor	Throughout Province.
10.	*Chrotogonus robertsi* Kirby	Germinating crops and all other vegetable seedlings.	Serious	On plains; not above 3,000 feet.
11.	*Chrotogonus concavus* Kirby	Germinating crops and all other vegetable seedlings.	Serious	On plains; not above 3,000 feet.
12.	*Acridella nasuta* Linn.	Germinating crops and all other vegetable seedlings.	Serious	On plains; not above 3,000 feet.
13.	*Aeolopus tamulus* Fabr.	Germinating crops and all other vegetable seedlings.	Serious	On plains; not above 3,000 feet.
14.	*Acrotylus insubricus* Scop.	Germinating crops and all other vegetable seedlings.	Serious	On plains; not above 3,000 feet.
15.	*Hieroglyphus oryzivorus* (Carl.)	Rice, sugar cane and jowar.	Serious	Nasirabad, Sibi District.
Gryllidae				
16.	*Acheta (Gryllulus) domestica* Linn.	Jowar, oil seeds, wheat and cotton.	Serious	Throughout plains; serious in Nasirabad subdivision (Sibi) and Kachhi (Kalat).
17.	*Liogryllus bimaculatus* De Geer	Jowar, oil seeds, wheat and cotton.	Serious	Throughout plains; serious in Nasirabad subdivision (Sibi) and Kachhi (Kalat).
		DERMAPTERA		
Forficulidae				
18.	*Anechura asiatica* Sem.	All kinds of rotting fruit, particularly apples, pomegranates, pears, peaches, plums, etc.	Minor	Throughout fruit-growing areas.

ISOPTERA

Calotermitidae			
19. *Architermopsis wroughtoni* Sem.	Old and dying fruit trees.	Minor	Throughout fruit-growing areas.

RHYNCHOTA

Pentatomidae			
20. *Eurygaster maura* Linn.	Wheat, maize, oats and barley.	Serious	Northeast; more common from 3,500–5,000 feet.
21. *Bagrada picta* Fabr.	Wheat, cabbages, turnips, cauliflowers, radishes and other Cruciferae.	Sporadic	Throughout hills.
22. *Apodiphus integriceps* Horv.	Apples, pears, plums, peaches, apricots and almonds.	Minor	Throughout hills.
23. *Acrosternum bactrianum* Kirk.	Apples, pears, plums, peaches, apricots and almonds.	Minor	Throughout hills.
24. *Eusarcocoris inconspicuus* (Herr-Schäff.)	Apples, pears, plums, peaches, apricots and almonds.	Minor	Throughout hills.
25. *Brachynema cincta* (Fabr.)	Apricots, peaches, plums and almonds.	Minor	Throughout hills.
26. *Rhaphigaster nebulosa* (Poda)	Apricots, peaches, plums and almonds.	Minor	Throughout hills.
27. *Eurydema festivum* Linn.	Cruciferous plants.	Minor	Throughout Province.
28. *Carpocoria fuscispinus* Boh.	Cruciferous plants.	Minor	Throughout Province.
29. *Aspongopus janus* Fabr.	Pumpkins, brinjals, gourds and cucurbits.	Sporadic	Throughout Province.
Lygaeidae			
30. *Lygaeus creticus* Luc.	Apples, pears, cherries, peaches, strawberries and raspberries.	Minor	Throughout hills, 3,000–6,000 feet.
31. *Oxycarenus laetus* Kirby	Apples, pears, plums, cherries, peaches and cotton.	Minor	Throughout hills; more common in cotton-growing areas.
Pyrrhocoridae			
32. *Dydercus cingulatus* Fabr.	Cotton.	Sporadically serious	Throughout cotton-growing areas.
Cicadidae			
33. *Sena quaerula* Pall.	Almost all kinds of fruit trees; apples, pears, quinces and walnuts are most affected.	Serious	Throughout Province, particularly on hills. Appears every 5 years.
34. *Paharia lacteipennis* Walk.	Almost all kinds of fruit trees; apples, pears, quinces and walnuts are most affected.	Serious	Throughout Province, particularly on hills. Appears every 5 years.
35. *Psalmocharias rugipennis* Walk.	Almost all kinds of fruit trees; apples, pears, quinces and walnuts are most affected.	Serious	Throughout Province, particularly on hills. Appears every 5 years.
36. *Cicadatra sankana* Dist.	Almost all kinds of fruit trees; apples, pears, quinces and walnuts are most affected.	Serious	Throughout Province, particularly on hills. Appears every 5 years.
37. *Cicadatra striata* Walk.	Almost all kinds of fruit trees; apples, pears, quinces and walnuts are most affected.	Serious	Throughout Province, particularly on hills. Appears every 5 years.

RHYNCHOTA (*Continued*)

Cicadidae (*Continued*)			
38. *Melampsalta musiva* Germ.	Almost all kinds of fruit trees; apples, pears, quinces and walnuts are most affected.	Serious	Throughout Province, particularly on hills. Appears every 5 years.
39. *Melampsalta continuata* Dist.	Almost all kinds of fruit trees; apples, pears, quinces and walnuts are most affected.	Serious	Throughout Province, particularly on hills. Appears every 5 years.
Jassidae			
40. *Empoasca decipiens* Paoli	Grapevines.	Serious	Throughout grape-growing areas.
41. *Empoasca devastans* Dist.	Cotton, bhindi and brinjal leaves.	Serious	Throughout cotton-growing areas.
42. *Idiocerus clypealis* Leth.	Mango bark and leaves.	Serious	Wherever mangoes grow.
43. *Idiocerus atkinsoni* Leth.	Mango bark and leaves.	Serious	Wherever mangoes grow.
Psyllidae			
44. *Psylla pyricola* Forst.	Pears and quinces.	Sporadically serious	Quetta-Pishin, Zhob and Loralai Districts.
45. *Diaphornia citri* Kuway	All kinds of citrus.	Serious	On plains.
Aphididae			
46. *Pterochlorus* (*Lachnus*) *persicae* (Cholodk.)	Peaches, nectarines, almonds, plums and apricots.	Very serious	Throughout hilly tracts; common from 3,000–8,000 feet.
47. *Myzus persicae* Sulz.	Peaches, nectarines, almonds, plums, apples, apricots and a number of crops and vegetables.	Very serious	Throughout Province; more serious on upland fruit trees.
48. *Brevicoryne brassicae* (Linn.)	Cabbages, cauliflowers, knol-khol, beans, radishes, turnips and sarsoon.	Very serious	Throughout hills; common from 3,000–7,000 feet.
49. *Callipterus juglandis* (Frisch.)	Walnuts.	Minor	Recorded only from Quetta and Loralai.
50. *Chromaphis juglandicola* (Kalt.)	Walnuts.	Sometimes serious	Uplands from 4,500–8,000 feet.
51. *Macrosiphum pisi* (Kalt.)	Cultivated and ornamental peas, beans, lucerne, etc.	Serious	Throughout Province; more serious on uplands.
52. *Macrosiphum granarium* Kirby	Wheat, barley, rice and maize.	Serious on wheat	Throughout Province; on plains and uplands.
53. *Aphis laburni* Kalt.	Lucerne, shaftal and berseem.	Serious	Throughout Province; more common on uplands.
54. *Aphis gossypii* Glover	Maize, cotton, potatoes, sarsoon, figs, melons, citrus, various vegetables, tomatoes and cucumbers.	Serious	Throughout Province.
55. *Macrosiphum rosae* (Linn.)	Cultivated roses.	Serious	Throughout the uplands.
56. *Anuraphis helichrysi* (Kalt.)	Peaches, plums, pears and almonds.	Serious	On uplands; more common from 3,000–6,000 feet.
57. *Hyalopterus arundinis* (Fabr.)	Peaches and plums.	Serious	On uplands.
58. *Eriosoma lanigerum* Hausm.	All varieties of apples.	Serious	Confined to Ziarat Valley from 6,000–8,000 feet.

Coccidae			
59. *Quadraspidiotus perniciosus* (Comst.)	Apples, pears, plums, almonds, peaches, apricots, cherries and quinces.	Serious	Throughout hills.
60. *Aspidiotus prunorum* Laing	Almonds, apples, plums and cherries.	Serious	Throughout hills.
61. *Eriochiton amygdalae* Rao	Almonds, peaches, apples and quinces.	Serious on almond	Abundant in Loralai, Zhob and Quetta-Pishin Districts from 4,500–6,000 feet.
62. *Lecanium coryli* (Linn.)	Almonds and plums.	Sometimes serious	Throughout hills.
63. *Parlatoria oleae* Colv.	Pears, plums, apricots, quinces, almonds, apples and peaches.	Serious	Throughout hills.
64. *Nilotespis halli* (Green)	Almonds.	Serious	Throughout hills.
65. *Pulvinaria loralaiensis* Rao	Cultivated pistachios, mulberries, apples, pears, plums, peaches, willows, etc.	Serious on pistachio	Common on hills from 4,000–6,000 feet.
66. *Lepidosaphes baluchistanensis* Rao	Almonds.	Serious	Common on hills from 4,000–6,000 feet.
67. *Aonidiella aurantii* Mask.	Citrus.	Serious	Common on hills from 2,000–4,500 feet.
68. *Pinnaspis excercitata* (Green)	Wild olives.	Minor	Only in Zhob District.
	LEPIDOPTERA		
Pieridae			
69. *Pieris brassicae* Linn.	Cabbages, cauliflowers and other Cruciferae.	Serious	Throughout Province; above 3,000 feet.
70. *Pieris rapae* Linn.	Cabbages, cauliflowers, knol-khol, turnips, etc.	Serious	Throughout Province; above 4,000 feet.
Gelechiidae			
71. *Platyedra gossypiella* Saund.	Cotton.	Serious	Throughout cotton-growing areas.
72. *Sitotroga cerealella* (Oliv.)	All stored grains.	Serious	Throughout Baluchistan.
73. *Anarsia lineatella* Zeller	Peaches, nectarines, plums and apricots.	Serious	Districts of Quetta-Pishin, Zhob and Loralai and Mastung and Kalat (Kalat State).
Hyponomeutidae			
74. *Hyponomeuta padella* Linn.	Apples.	Serious	Confined only to Ziarat Valley, 6,000–8,000 feet.
Tortricidae			
75. *Archips* (*Cacoecia*) *sarcostega* (Meyr.)	Apples, peaches, nectarines, apricots, plums, cherries, pears, quinces and roadside trees.	Serious	Quetta-Pishin, Zhob and Loralai Districts, Ziarat Valley and Mastung and Kalat (Kalat State).

LEPIDOPTERA (*Continued*)

Tortricidae (*Continued*)			
76. *Archips* (*Cacoecia*) *subsidiaria* (Meyr.)	Apples, nectarines, peaches and plums.	Serious	Quetta-Pishin, Zhob and Loralai Districts, Ziarat Valley and Mastung and Kalat (Kalat State).
77. *Archips* (*Cacoecia*) *pomivora* (Meyr.)	Apples.	Sometimes serious	Quetta-Pishin, Zhob and Loralai Districts, Ziarat Valley and Mastung and Kalat (Kalat State).
78. *Archips* (*Cacoecia*) *philippa* (Meyr.)	Apples.	Minor	Quetta-Pishin District.
Eucosmidae			
79. *Cydia pomonella* (Linn.)	Apples, pears and quinces.	Very serious	Throughout Province.
80. *Spilonota ocellana* Schiff.	Apples, plums, peaches, quinces and cherries.	Serious	Quetta-Pishin, Zhob and Loralai Districts and Mastung and Kalat (Kalat State).
Pyralididae			
81. *Euzophera punicella* Moore	Pomegranates, apples, pears and quinces.	Serious	Districts of Quetta-Pishin, Zhob and Loralai and Sarawan and Jhalawan (Kalat State).
82. *Etiella zinckenella* Treit.	Gram and pea pods and pulses.	Sporadically serious	Throughout Province.
83. *Plodia interpunctella* Hübner	Food grains, dried fruits, herbs, etc.	Sporadically serious	Throughout Province.
84. *Corcyra cephalonica* (Staint.)	Stored grains, milled products, dried fruits, biscuits, oil cakes.	Serious	Abundant on hills.
85. *Phycita infusella* Meyr.	Cotton.	Minor	Nasirabad (Sibi) and Makran State.
86. *Sylepta derogata* (Fabr.)	Cotton and other Malvaceae.	Sporadically serious	Throughout cotton-growing areas.
87. *Emmalocera depressella* Swin.	Sugar cane, sorghum and maize.	Minor	Common on plains.
88. *Ephestia kuehniella* Zeller	Flour, stored grains, dried fruits, etc.	Serious	Throughout Province.
89. *Ephestia cautella* Wlk.	Flour, stored grains, dried fruits, etc.	Serious	Throughout Province.
90. *Schoenobius bipunctifer* Wlk.	Paddy.	Serious	Nasirabad (Sibi) and Makran State.
Sphingidae			
91. *Theretra alecto alecto* (Linn.)	Grape leaves.	Sometimes serious	Throughout grape-growing areas. More common in Quetta-Pishin District.
92. *Celerio lineata livornica* (Esp.)	Grape leaves.	Sometimes serious	Throughout grape-growing areas. More common in Quetta-Pishin District.

93. *Celerio euphorbiae robertsi* (Butl.)	Grape leaves.	Sometimes serious	Throughout grape-growing areas. More common in Quetta-Pishin District.
94. *Herse convolvuli convolvuli* (Linn.)	Grape leaves.	Sometimes serious	Throughout grape-growing areas. More common in Quetta-Pishin District.
95. *Macroglossum stellatarum* (Linn.)	Grape leaves.	Minor	Throughout grape-growing areas. More common in Quetta-Pishin District.
Saturniidae			
96. *Saturnia stoliczkana* Feld.	Apples, quinces and apricots.	Serious	Throughout hills; more common in the Districts of Quetta-Pishin, Zhob and Loralai.
Arctiidae			
97. *Axiopoena maura* Eichw.	Apples, quinces and apricots.	Minor	Throughout hills.
Plutellidae			
98. *Plutella maculipennis* (Curtis)	Cabbages, cauliflowers, knol-khol, radishes, mustard, etc.	Serious	Throughout Province; more common in the Districts of Quetta-Pishin, Zhob, Loralai and Sibi.
Glyphipterygidae			
99. *Phycodes radiata* Ochs.	Figs.	Serious	Throughout uplands.
Noctuidae			
100. *Euxoa segetum* Schiff.	Potatoes, tobacco, beetroot and garden and vegetable crops.	Serious	Common on hills.
101. *Heliothis obsoleta* Fabr.	Gram, oats, cotton, lucerne, roses, peas, maize, cotton, bajra, tobacco and tomatoes.	Sometimes serious	Throughout Province.
102. *Heliothis armigera* Hübn.	Gram, oats, cotton, lucerne, roses, peas, maize, cotton, bajra, tobacco and tomatoes.	Sometimes serious	Throughout Province.
103. *Eublemma olivacea* Wlk.	Brinjals.	Minor	Throughout Province.
104. *Apopestes spectrum* Esp.	Various kinds of vegetables.	Minor	Throughout Province.
105. *Prodenia litura* Fabr.	Polyphagus, especially tobacco, maize, rice, cauliflowers, cabbages, apples and vegetables.	Sometimes appear in large numbers	Throughout Province; plains and uplands.
106. *Earias fabia* Stoll.	Cotton and bhindi.	Serious	Throughout cotton-growing areas.
107. *Earias insulana* Boisd.	Cotton and bhindi.	Serious	Throughout cotton-growing areas.
Lymantriidae			
108. *Euproctis signata* Blan.	Apples, peaches, plums and apricots.	Serious	Quetta-Pishin District only, but slowly spreading.

LEPIDOPTERA (*Continued*)

Lymantriidae (*Continued*)			
109. *Euproctis fraterna* Moore	Apples, almonds, pears, pomegranates, mulberries and roses.	Not serious	Confined to Loralai District; occurs below 4,000 feet.

COLEOPTERA

Nitidulidae			
110. *Carpophilus hemipterus* Linn.	Attack rotten apples, pears, peaches and pomegranates.	Serious	Throughout hills.
111. *Carpophilus dimidiatus* Linn.	Attack rotten apples, pears, peaches and pomegranates.	Serious	Throughout hills.
112. *Carpophilus obsoletus* Er.	Attack rotten apples, pears, peaches and pomegranates.	Serious	Throughout hills.
Cucujidae			
113. *Oryzaephilus surinamensis* (Linn.)	Grains, dried fruits, tobacco, snuff, etc.	Sometimes serious	Throughout Province; coming in large numbers in dried fruits imported from Afghanistan.
114. *Oryzaephilus mercator* (Fauv.)	Grains, dried fruits, tobacco, snuff, etc.	Sometimes serious	Throughout Province; coming in large numbers in dried fruits imported from Afghanistan.
115. *Laemophlaeus minutus* (Oliv.)	Scavenger. Infests damaged products.	Minor	Throughout Province.
Buprestidae			
116. *Capnodis kashmirensis* Frm.	Peaches, almonds and apricots.	Serious	Throughout hills.
117. *Capnodis miliaris* Klug	Peaches, almonds and apricots.	Serious	Throughout hills.
118. *Capnodis parumstriata* Ball.	Peaches, almonds and apricots.	Serious	Throughout hills.
119. *Sphenoptera tappesi* Mars.	Peaches, almonds and cherries.	Sometimes serious	Throughout hills.
120. *Julodis whithilli* Gray	Melons and other cucurbits.	Minor	Throughout hills.
Elateridae			
121. *Agriotes meticulosus* Cand.	Potatoes and strawberries.	Sometimes serious	Quetta and Ziarat only.
122. *Agrypnus moestus* Cand.	Potatoes and strawberries.	Sometimes serious	Quetta and Ziarat only.
Tenebrionidae			
123. *Tribolium castaneum* Herbst	Wheat products and damaged grains.	Very serious	Throughout Baluchistan.
124. *Tribolium confusum* Jacq. du V.	Wheat products and damaged grains.	Minor	Throughout Baluchistan.
125. *Latheticus oryzae* Waterh.	Stored wheat, jowar and other food grains.	Not serious	Throughout Baluchistan.
Chrysomelidae			
126. *Plagiodera versicolor* Laich.	Grape leaves.	Minor	Throughout grape-growing areas.
127. *Aulacophora abdominalis* Fabr.	Cultivated cucurbits.	Serious	Throughout Province; more abundant on uplands.

128. *Aulacophora atripennis* Fabr.	Cultivated cucurbits.	Minor	Throughout Province.
129. *Hispa armigera* Oliv.	Young rice plants.	Serious	Nasirabad (Sibi) and Makran State.
Cerambycidae			
130. *Prionus ellioti* Gahan	Apricots, almonds, peaches and poplars.	Minor	On uplands.
131. *Apatophysis modica* Gahan	Apricots, almonds, peaches and poplars.	Minor	Quetta-Pishin District only.
132. *Oxymirus cursor* Linn.	Apple, apricot, peach, almond and roadside trees.	Minor	On uplands.
133. *Diorthus simplex* White	Felled, fallen and dying fruit and roadside trees.	Minor	Throughout Province, particularly on plains.
134. *Derolus mauritanicus* Buquet	Felled, fallen and dying fruit and roadside trees.	Minor	Throughout Province, particularly on plains.
135. *Quettania coeruleipennis* Schwarzer	Apricots, cherries, plums, almonds, quinces and pomegranates.	Serious	Common in Quetta-Pishin and Loralai from 4,500–6,000 feet.
136. *Macrotoma crenata* Fabr.	Fruit and roadside trees.	Minor	Throughout Province.
137. *Aeolesthes sarta* Solsky	Apples, apricots, peaches, quinces, walnuts and almonds.	Serious	Throughout Province; common on uplands.
138. *Batocera rufomaculata* De Geer	Figs.	Serious	Common on uplands.
Curculionidae			
139. *Polydrusus obliquatus* Fst.	Apples and peaches.	Minor	On uplands.
140. *Sitophilus oryzae* (Linn.)	Stored grains.	Very serious	Throughout hills.
141. *Sitophilus granaria* Linn.	Stored grains.	Minor	Throughout hills.
142. *Myllocerus maculosus* Desbr.	Cotton, bajra, maize, bhindi, mung, guava, sugar cane, etc.	Minor	Throughout hills.
Scolytidae			
143. *Scolytus amygdalae* Guér.	Apricots, almonds, peaches, cherries, nectarines, apples, plums and quinces.	Serious	Quetta-Pishin, Zhob and Loralai Districts.
144. *Scolytus fasciatus* Rtt.	Apricots, almonds and cherries.	Minor	Quetta-Pishin, Zhob and Loralai Districts.
Scarabaeidae			
1. Cetoniinae			
145. *Epicometis (Tropinota) squalida* (Linn.)	Cherries and peaches.	Serious	Common in Quetta-Pishin District.
146. *Epicometis (Tropinota) turanica* Rtt.	Cherries, peaches, pears and apples.	Serious	Common in Quetta-Pishin District.
147. *Stalagmosoma albella* Pall.	Cherries.	Serious	Common in Quetta-Pishin District.
148. *Protaetia impavida* Jans.	Cherries.	Minor	Common in Quetta-Pishin District.
149. *Protaetia affinis* Anders.	Cherries.	Minor	Common in Quetta-Pishin District.
150. *Oxythyrea cinctella* Sch.	Cherries.	Minor	Common in Quetta-Pishin District.

COLEOPTERA (*Continued*)

Scarabaeidae (*Continued*)			
2. Dynastinae			
151. *Oryctes nasicornis* Linn. var. *gryphus* Ill.	Apricots and other fruit trees.	Sometimes serious	Throughout hills.
152. *Pentodon bispinifrons* Rtt.	Almond and other fruit trees.	Minor nursery pest	Throughout hills.
153. *Pentodon idiota* Herbst	Almond and other fruit trees.	Minor nursery pest	Throughout hills.
154. *Xylotrupes gideon* Linn.	All kinds of fruit trees.	Minor	Throughout hills.
155. *Xylotrupes mniszechi* Thomas	All kinds of fruit trees.	Minor	Throughout hills.
156. *Phyllognathus silenus* Fabr.	Peach and other fruit trees.	Minor nursery pest	Throughout Province.
157. *Phyllognathus excavatus* Forst.	Peach and other fruit trees.	Minor nursery pest	Throughout Province.
158. *Phyllognathus dionysius* Fabr.	Peach and other fruit trees.	Minor nursery pest	Throughout Province.
3. Melolonthinae			
159. *Polyphylla adspersa* Mots.	Almonds and apples.	Serious nursery pest	Common on hills.
4. Rutelinae			
160. *Adoretus brachypygus* Burm.	Apples, plums, pears, peaches and apricots.	Sometimes serious	Throughout hills.
161. *Adoretus flavus* Arr.	Apples, plums, pears, peaches and apricots.	Minor	Throughout hills.
Bruchidae			
162. *Pachymerus (Bruchus) chinensis* (Linn.)	Stored grains, pulses, peas, beans, etc.	Serious	Throughout Province.
163. *Laria (Bruchus) affinis* Fröl.	Stored grains, pulses, peas, beans, etc.	Serious	Throughout Province.
Dermestidae			
164. *Trogoderma granaria* Everts	Wheat, oats, maize, jowar, animal foods, etc.	Very serious on wheat	Present throughout Province; serious on plains.
165. *Trogoderma versicolor* Creutz.	Vegetable seeds of all kinds.	Minor	Throughout Province; also found in vegetable seeds imported from Afghanistan.
166. *Attagenus piceus* (Oliv.)	Primarily carpets and woolen articles. Also infests grain and vegetable seeds.	Minor	Common on hills.
167. *Attagenus lobatus* Ros.	Primarily carpets and woolen articles. Also infests grain and vegetable seeds.	Minor	Common on hills.

Bostrychidae			
168. *Rhizopertha dominica* (Fabr.)	All kinds of husked and unhusked grains, dried fruits and food grain products.	Very serious	Throughout Province; serious in warmer areas.
Trogositidae			
169. *Tenebrioides mauritanicus* (Linn.)	Almost every kind of food grain.	Minor	Confined to hills.
	HYMENOPTERA		
Vespidae			
170. *Polistes hebraicus* Fabr.	Grapes, pears, etc.	Minor	Throughout hills.
171. *Polistes gallicus* Linn.	Grapes.	Sometimes serious	Throughout hills.
172. *Vespa orientalis* Fabr.	Grapes, apricots, pears, pomegranates, etc.	Serious	Throughout hills.
173. *Vespa bicolor* Fabr.	Grapes, apricots, pears, pomegranates, etc.	Sometimes serious	Throughout hills.
174. *Vespa germanica* Fabr.	Grapes, apricots, pears, pomegranates, etc.	Sometimes serious	Throughout hills.
	DIPTERA		
Trypetidae			
175. *Dacus* (*Strumeta*) *ferrugineus* Fabr.	Peaches, pears, plums, pomegranates, apples, mangoes and guavas.	Serious	Throughout hills.
176. *Dacus* (*Strumeta*) *zonatus* Saund.	Peaches, pears, plums, apples and pomegranates.	Serious	Throughout hills.
177. *Dacus* (*Strumeta*) *cucurbitae* Coq.	Peaches, apples, melons, cucurbits, citrus, tomatoes and various vegetables.	Serious	Throughout hills.
178. *Dacus* (*Strumeta*) *ciliatus* Loew (*brevistylus* Bezzi)	Melons and other cucurbits.	Minor	Throughout uplands.
179. *Myiopardalis pardalina* Big.	Watermelons, sweet and muskmelons, pumpkins, etc.	Very serious	Throughout uplands.

SECTION B: LIST OF INSECTS RECORDED FROM BALUCHISTAN

No.	*Name*	*Distribution*
		THYSANURA
Lepismatidae		
1.	*Lepisma saccharina* Fabr.	Common in buildings, attacking paper, etc.
		ORTHOPTERA
Blattidae		
2.	*Polyphaga aegyptica* Linn.	Common in houses throughout Province, particularly in uplands.
Acrididae		
3.	*Acrydium bipunctatum* Linn.	Submountainous tracts, feeding on wild bushes and also in cultivated fields. Adults appear April–July.
4.	*Acrydium quadriplagiatum* Wlk.	In plains and submountainous tracts on wild bushes. Adults appear April–July.
5.	*Gomphomastax antennatus* Brunn.	Rare. Found in hilly tracts above 5,500 feet. June–September. Feeds on wild grasses, weeds, etc.
6.	*Gomphomastax constrictus* Brunn.	Adults appear June–September at 4,000–6,000 feet. Not very common.
7.	*Acrida turrita* Linn.	Common in the plains and hilly tracts below 3,000 feet. Found in cultivated fields April–July.
8.	*Acrida lugubris* Burr	In hilly tracts; more common 3,000–5,000 feet. Adults appear May–September and are found on wild bushes and in cultivated fields.
9.	*Stenobothrus luteipes* Walk.	In hilly tracts; more common 3,500–6,000 feet. Adults found on wild bushes and in cultivated fields from May–September.
10.	*Chorthippus dorsatus* Zett.	Rare. Recorded only from Quetta from tomato fields during May–June.
11.	*Quiroguesia blanchardiana* Sauss.	Rare. Found in uplands, particularly in desert areas. Adults recorded during May feeding on wild bushes.
12.	*Morphacris citrina* Kirby	In plains as well as hilly tracts up to 3,000 feet. Adults collected during June from grassy areas.
13.	*Oedaleus nigrofasciatus* Sauss.	Occurs in the hottest parts of the Province, particularly south and southwest. Adults common on wild bushes and weeds during July.
14.	*Oedalus senegalensis* Krauss.	Occurs in south and southwestern parts of Province. Common in desert areas where adults are found feeding on wild bushes and vegetation during May–June.
15.	*Gastrimargus transversus* Thumb.	Only in uplands on the slopes of hills and in valleys feeding on wild vegetation. Adults common in June–August.
16.	*Locusta migratorioides* R. & F.	Widely distributed throughout Province. Common during summer.
17.	*Locusta danica* Linn.	Distributed throughout Province. Common during summer.
18.	*Sphingonotus coerulans* Linn.	In uplands 4,000–6,000 feet in valleys. Adults collected under stones May–September.
19.	*Sphingonotus rubescens* Wilk.	Common in uplands 3,000–6,000 feet. Adults found from May–August in orchards, cultivated fields and in valleys.
20.	*Sphingonotus savignyi* Sauss.	Only at higher altitudes, 5,000–6,000 feet, in orchards. Adults collected May–August. Not very common.
21.	*Sphingonotus longipennis* Sauss.	Rare. Adults collected in July, 5,500–6,500 feet, in Shirani Valley, Zhob District.
22.	*Sphingonotus balteatus* Ser.	Throughout uplands; more common 3,500–6,000 feet. Adults found May–September in cultivated fields and orchards.
23.	*Sphingonotus gigas* Kirby	Recorded only from Quetta (5,500 feet) in July from vegetable fields. Probably more widely distributed.
24.	*Sphingonotus montanus* Motsch.	Throughout uplands; more common 3,500–6,000 feet. Adults found June–August in orchards or cultivated fields.
25.	*Eremopeza granulosa* Walk.	In uplands. So far recorded from Quetta (5,500 feet), probably more widely distributed. Adults collected in May from cultivated fields.
26.	*Eremopeza brachycera* Kirby	Recorded only from Quetta (5,500 feet) from various orchards; adults feeding on grasses, weeds, etc.

27. *Chrotogonus brevis* Bol.	On plains in cultivated fields. Adults common April–June.
28. *Chrotogonus robertsi* Kirby	Recorded from Quetta Valley in cultivated fields. Common throughout hilly tracts. Adults found May–June.
29. *Chrotogonus concavus* Kirby	Recorded from Quetta (5,500 feet) in orchards feeding on grasses and weeds. Adults common June–July.
30. *Poecilocerus pictus* Fabr.	In plains and submountainous regions. Adults feed on weeds, grasses, etc., April–July.
31. *Poecilocerus punctiventris* Serv.	In plains; adults found in cultivated fields April–June.
32. *Pyrgomorpha conica* Oliv.	Adults common June–August. Found in cultivated fields in uplands.
33. *Atractomorpha blanchardi* Kirby	Recorded only from plains. Adults common in cultivated fields April–July.
34. *Ischnacrida convergens* Walk.	In plains; adults common March–June in cultivated fields.
35. *Orthacanthacris aegpytia* Linn.	In uplands; adults found feeding in orchards April–July.
36. *Orthacanthacris japonica* Bol.	In upland orchards; adults common April–May.
37. *Cyrtacanthacris ranacea* Stoll.	Common in the mountainous regions. Adults found May–June feeding on weeds, etc.
38. *Apalacris varicornis* Walk.	In plains in cultivated fields March–July. Rare.
39. *Kripa undulata* Kirby	Rare. Found in plains in cultivated fields March–May.
40. *Caloptenopsis liturifer* Walk.	Rare. Occurs in the uplands feeding on wild bushes, etc., May–July.
41. *Caloptenopsis glaucopis* Walk.	In plains March–April. Not very common.
42. *Heteracris elegans* Walk.	Rare. Found in plains in cultivated fields March–May.
43. *Calliptamus italicus* Linn.	Found in the hilly tracts from 3,500–6,000 feet. Adults from April–June attack crops and vegetables. Only loose swarms are found on this Italian locust.
44. *Calliptamus siculus* Burm.	Occurs throughout Baluchistan. Adults very common in July–August; feed on various fruit trees and also found in cultivated fields.
45. *Catantops annexus* B.	Found throughout Province in orchards, cultivated fields, etc. Adults common March–July.
46. *Acridella nasuta* Linn.	Common in the plains in cultivated fields; adults found March–April.
47. *Aeolopus tamulus* Fabr.	Common in the plains; adults found March–April in cultivated fields.
48. *Acrotylus insubricus* Scop.	Rare. Found in the plains in cultivated fields March–April.
49. *Hieroglyphus oryzivorus* (Carl.)	So far confined to plains of Sibi District. Pest of rice, etc. Adults common August–November.
50. *Schistocerca gregaria* Forsk.	Throughout Baluchistan when in swarming phase; otherwise confined to desert areas which form its permanent breeding home.

Gryllidae

51. *Acheta (Gryllulus) domestica* Linn.	Throughout Province. Large numbers in plains only. Common during summer.
52. *Acheta (Gryllulus) configurata* Fabr.	Throughout Baluchistan. Found in large numbers during winter in the plains.
53. *Acheta (Gryllulus) burdigalensis* Latr.	Throughout Baluchistan. Found in association with *Acheta domestica* in plains during summer.
54. *Acheta (Gryllulus) lineceps* Walk.	Throughout Baluchistan; particularly common in the plains during summer.
55. *Acheta (Gryllulus) chudeani* Chp.	In plains during summer.
56. *Liogryllus bimaculatus* De Geer	Throughout Baluchistan but found in large numbers in plains during summer.
57. *Pteronemobius vagus* Wlk.	In plains; more common in the southern areas during summer.
58. *Gryllopsis rufiniger* Chp.	Collected from plains during summer.

DERMAPTERA

Forficulidae

59. *Anechura asiatica* Sem.	Common in fruit-growing tracts.

ISOPTERA

Calotermitidae

60. *Architermopsis wroughtoni* Sem.	Common in uplands. Swarming of adults seen in July.

ODONATA

Coenagriidae

61. *Sympycna paedisca annulata* Selys.	Common in the hilly tracts from 4,000–6,000 feet in June–July.
62. *Ischnura elegans* (Van der Linden)	Occurs around Quetta (5,500 feet) during May–July.
63. *Ischnura forcipata* Morton	Common in uplands above 4,000 feet in June.

Agriidae

64. *Epallaga fatima* Charpentier	Throughout Baluchistan from 5,000–6,000 feet in June.

Libellulidae

65. *Orthetrum brunneum brunneum* (Fonscolombe)	Common from 3,000–6,000 feet in June–July.
66. *Orthetrum anceps* (Schneider)	Common from 3,000–6,000 feet in June. So far recorded from Baluchistan only in the Indo-Pakistan region.
67. *Sympetrum decoloratum* (Selys.)	So far recorded only from Quetta; probably more widely distributed. Found in June–July.
68. *Sympetrum fonscolombei* (Selys.)	Common in uplands from 4,000–6,000 feet in November–March.
69. *Sympetrum meridionale* (Selys.)	Found from 3,000–6,000 feet in May–July.
70. *Selysiothemis nigra* (Van der Linden)	Common on Makran coast where it is found in large numbers.

RHYNCHOTA

A—Heteroptera

Pentatomidae

71. *Eurygaster maura* Linn.	Common in northeastern parts of the Province. Adults common during winter and spring.
72. *Bagrada picta* Fabr.	Common in the eastern parts of the Province. Adults found in summer.
73. *Apodiphus integriceps* Horv.	Common throughout hilly tracts. Adults found in orchards during summer.
74. *Acrosternum bactrianum* Kirk.	Found in uplands in orchards. Adults collected during summer.
75. *Eusarcocoris inconspicuus* (Herr-Schäff.)	Common in hilly tracts; adults found on fruit trees in summer.
76. *Brachynema cincta* (Fabr.)	Throughout hilly tracts; adults found during summer.
77. *Rhaphigaster nebulosa* (Poda)	Throughout hilly tracts; adults found during summer.
78. *Eurydema festivum* Linn.	Throughout hilly tracts; adults found during summer.
79. *Carpocoria fuscispinus* Boh.	Throughout hilly tracts; adults found during summer.
80. *Aspongopus janus* Fabr.	Throughout hilly tracts; adults found during summer.

Lygaeidae

81. *Lygaeus creticus* Luc.	Found in uplands; adults collected from orchards May–June.
82. *Calyptopotus rolandri* Linn.	Rare. Occurs in mountainous regions. Adults found June–July.
83. *Oxycarenus laetus* Kirby	Found throughout Province. Adults collected from orchards March–May.

Pyrrhocoridae

84. *Dydercus cingulatus* Fabr.	Common in plains; adults found during summer.
85. *Pyrrhocoris apterus* Fall.	Common on shade trees in uplands.
86. *Scantius* sp.	Common on shade trees in uplands.

Reduviidae

87. *Reduvia fedtschenkianus* Osh.	Occurs in uplands on fruit trees. Common during summer.
88. *Reduvia pallipes* Klug	Occurs in uplands on fruit trees. Common during summer.
89. *Rhaphidosoma tuberculatum* Dist.	In uplands. Collected from fruit trees in orchards.
90. *Acanthaspis quinquespinosa* Fabr.	In uplands. Collected from fruit trees in orchards.

Notonectidae

91. *Notonecta marmorea mediterranea* Hutch.	Rare. Occurs on fruit trees in orchards in uplands.
92. *Anisops sardea* H. & S.	Rare. Occurs on fruit trees in orchards in uplands.

Nepidae

93. *Ranatra filiformis* Fabr.	Rare. Collected from fruit trees in orchards in uplands.

B—HOMOPTERA

Cicadidae

94. *Sena quaerula* Pall.	Throughout hilly tracts when swarms appear. Adults common May–June.
95. *Paharia lacteipennis* Walk.	Throughout hilly tracts when swarms appear. Adults common May–June.
96. *Psalmocharias rugipennis* Walk.	Throughout hilly tracts when swarms appear. Adults common May–June.
97. *Cicadatra sankana* Dist.	Throughout hilly tracts when swarms appear. Adults common May–June.
98. *Cicadatra striata* Walk.	Throughout hilly tracts when swarms appear. Adults common May–June.
99. *Melampsalta musiva* Germ.	Throughout hilly tracts when swarms appear. Adults common May–June.
100. *Melampsalta continuata* Dist.	Throughout hilly tracts when swarms appear. Adults common May–June.

Jassidae

101. *Empoasca decipiens* Paoli	Throughout grape-growing tracts.
102. *Empoasca devastans* Dist.	Throughout cotton-growing areas.
103. *Idiocerus clypealis* Leth.	Only in plains.
104. *Idiocerus atkinsoni* Leth.	Only in plains.

Aleurodidae

105. *Dialeurodes citri* Ashmead	In plains in citrus orchards.

Psyllidae

106. *Psylla pyricola* Forst.	In uplands only on pear trees.
107. *Diaphornia citri* Kuway	In plains on citrus trees.

Aphididae

108. *Pterochlorus (Lachnus) persicae* (Cholodk.)	Throughout hilly tracts. Serious pest of fruit trees.
109. *Myzus persicae* Sulz.	Throughout Province; more common in hilly tracts. Serious pest of fruit trees.
110. *Brevicoryne brassicae* (Linn.)	Throughout hilly tracts. Serious pest of cabbage, etc.
111. *Callipterus juglandis* (Frisch.)	Occurs in uplands where walnuts are grown.
112. *Chromaphis juglandicola* Kalt.	Occurs in uplands where walnuts are grown.
113. *Macrosiphum pisi* Kalt.	Throughout Province; more common in hilly tracts.
114. *Macrosiphum granarium* Kirby	Throughout Province where wheat is grown.
115. *Macrosiphum rosae* (Linn.)	Found in uplands on wild roses.
116. *Aphis laburni* Kalt.	Throughout Province; more common in hilly tracts.
117. *Aphis gossypii* Glover	Throughout Province.
118. *Anuraphis helichrysi* (Kalt.)	Throughout uplands on pears and plums in the orchards. Serious pest.
119. *Hyalopterus arundinis* (Fabr.)	Throughout uplands in orchards.
120. *Eriosoma lanigerum* Hausm.	Confined to higher altitudes on apple trees.

Coccidae

121. *Quadraspidiotus perniciosus* (Comst.)	Throughout hilly tracts on a variety of host plants.

B—Homoptera (*Continued*)

Coccidae (*Continued*)

122. *Aspidiotus prunorum* Laing	So far recorded from Quetta (5,500 feet) on fruit trees.
123. *Eriochiton amygdalae* Rao	Occurs throughout almond-growing regions. More serious in Loralai and Zhob Districts.
124. *Lecanium coryli* (Linn.)	In hilly tracts. Not very common.
125. *Parlatoria oleae* Colv.	Throughout hilly tracts. Common in orchards; also found on wild bushes, etc
126. *Nilotespis halli* (Green)	Not very common. Found in uplands.
127. *Pulvinaria loralaiensis* Rao	Occurs in uplands; more common in Loralai District on fruit trees.
128. *Lepidosaphes baluchistanensis* Rao	Occurs in uplands; more common in Loralai District on fruit trees.
129. *Pinnaspis excercitata* (Green)	Not common. Occurs in uplands.
130. *Aonidiella aurantii* Mask.	Common in plains in citrus orchards.

NEUROPTERA

Myrmeleonidae

131. *Nesoleon lipeosus* Ramb.	Common in uplands. Adults attracted to light at night.

LEPIDOPTERA

A—Rhopalocera

Papilionidae

132. *Troides aristolochiae* Fabr.	Collected from Zhob District in September.
133. *Papilio demoleus demoleus* Linn.	Occurs in plains and submountainous regions. Adults common March–May.
134. *Papilio alexanor alexanor* Esp.	Rare. Occurs at higher altitudes (6,000 feet).
135. *Papilio machaon centralis* Stg.	Found in suburbs of Quetta, Ziarat, etc., May–September.
136. *Hypermnestra helios balucha* (Moore)	Very rare. Collected from Quetta and Nushki in April.

Pieridae

137. *Euchloë charlonia pila* Evans	Rare. Collected from Zhob District.
138. *Euchloë charlonia doveri* Evans	Rare. Found in northern and western Baluchistan.
139. *Euchloë belemia* Esp.	Common along Makran coast.
140. *Euchloë ausonia daphalis* Moore	Occurs in northern Baluchistan 5,000–8,000 feet elevation. Collected in April.
141. *Euchloë ausonia pulverata* Christoph	Occurs in Chiltan range above 7,500 feet height near Quetta.
142. *Pieris chloridice* Hüb.	Rare. Occurs at 6,000 feet May–June.
143. *Pieris daplidice moorei* Rob.	Common above 5,000 feet April–September.
144. *Pieris glauconome* Klug	Fairly common April-September both in uplands and plains.
145. *Pieris krueperi* De N.	Rare. Found at higher altitudes (8,000–9,000 feet) in May–June.
146. *Pieris canidia indica* Evans	Common at higher altitudes (Zhob District) July–September.
147. *Pieris brassicae* Linn.	Common at higher altitudes (5,500–8,000 feet) practically throughout year.
148. *Pieris rapae* Linn.	Found throughout Province above 4,000 feet practically throughout year. Commonest butterfly in Quetta.
149. *Aporia leucodice balucha* Marshall	Common around Quetta and Ziarat May–June.
150. *Belenois mesentina mesentina* Cr.	Common throughout Baluchistan all year round.
151. *Catopsilia crocale* Cr.	Found in uplands 4,000–6,000 feet. Quite common June–August.
152. *Catopsilia pomona* (Fabr.)	Common in plains and uplands May–August.
153. *Catopsilia pyranthe minna* Herbst	Appears as migrant from plains into Baluchistan August–September.
154. *Gonepteryx rhamni rhamni* Linn.	Not common but often seen April–September at higher altitudes (4,700–7,000 feet) in northern Baluchistan.
155. *Eurema hecabe* Linn.	Common in plains, particularly in Sibi during March–April.

156.	*Colias erate erate* (Esper)	Common throughout Baluchistan above 3,000 feet throughout year.
157.	*Colias electo fieldi* Ménétries	Occurs above 6,000 feet May–September.
158.	*Ixias pyrene kausala* Moore	Common in Bolan in spring and autumn.
159.	*Colotis calais amata* (Fabr.)	Not uncommon in tamarisk forests in plains in autumn and spring.
160.	*Colotis protractus* Butler	At Sibi May–June.
161.	*Colotis vestalis* Butler	Very common at Sibi in autumn and spring.
162.	*Colotis fausta fausta* (Olivier)	Common in Bolan and Chagai during September–October.
163.	*Colotis etrida etrida* (Boisduval)	Found in plains as well as uplands in autumn and spring.
164.	*Colotis danae dulcis* (Butler)	Rare. Found at Sibi in autumn and spring.

Danaïdae

165.	*Danaus limniace leopardus* (Butler)	Found everywhere in Baluchistan; more common March–May.
166.	*Danaus plexippus plexippus* (Linn.)	Rare. Found at higher altitudes.
167.	*Danaus chrysippus chrysippus* (Linn.)	Found throughout Baluchistan practically throughout the year.

Satyridae

168.	*Pararge menava menava* (Moore)	Rare. Found above 6,000 feet April–September.
169.	*Pararge schakra schakra* (Kollar)	Found only in Zhob District at 4,500–11,000 feet August–September.
170.	*Coenonympha myops macmahoni* (Swin.)	Occurs above 6,000 feet; common March–May.
171.	*Maniola lupinus centralis* (Riley)	Common at 7,000 feet June–July.
172.	*Maniola narica* Hüb.	Common in May at 7,000 feet.
173.	*Maniola wagneri mandane* (Kollar)	Very rare in Baluchistan.
174.	*Maniola davendra latistigma* Moore	Very common above 3,000 feet May–September.
175.	*Maniola tenuistigma tenuistigma* Moore	Not uncommon above 7,000 feet June–July.
176.	*Hipparchia parisatis parsis* (Le Cerf)	Common everywhere above 3,000 feet May–September.
177.	*Hipparchia persephone enervata* (Staudinger)	Not uncommon May–August from 4,000–6,000 feet.
178.	*Hipparchia mniszechii balucha* (Evans)	Common June–August at 6,000 feet.
179.	*Hipparchia thelephassa* (Hüb.)	Common in Province above 4,000 feet May–September.
180.	*Hipparchia actaea ziara* Talbot	Not uncommon in July–August above 7,000 feet.
181.	*Aulocera padma burnetti* Evans	Very rare. Collected from Shingarh in Zhob District in August–September.
182.	*Ypthima asterope mahratta* Moore	Rare. Occurs at 4,000 feet.
183.	*Ypthima bolanica* Marshall	Rare. Found above 3,000–6,000 feet April–August.

Nymphalidae

184.	*Hypolimnas misippus* Linn.	Common almost throughout year.
185.	*Hypolimnas bolina* Linn.	Common June–September.
186.	*Precis hierta hierta* (Fabr.)	Common August–September.
187.	*Precis orithya swinhoei* Butler	Frequently seen in uplands during summer and autumn.
188.	*Vanessa cardui* Linn.	Common everywhere throughout year.
189.	*Vanessa atalanta* Linn.	Rare. Occurs at higher altitudes in August.
190.	*Vanessa egea balucha* Evans	Occurs at higher altitudes in spring to end June.
191.	*Vanessa egea pallida* Evans	Less common at higher altitudes in May–June.
192.	*Vanessa xanthomelaena* D. & S.	Rare. Collected from Quetta in June.
193.	*Argynnis hyperbius* Johanssen	Occurs at higher altitudes; found in late spring and autumn.
194.	*Argynnis lathonia lathonia* (Linn.)	Common from 5,500–8,000 feet from end of June to September. Sometimes also in late autumn and early spring.
195.	*Melitaea trivia persea* (Kollar)	Recorded at 3,000 feet April–June.

A—Rhopalocera (*Continued*)

	Nymphalidae (*Continued*)	
196.	*Melitaea robertsi* Butler	Common at higher altitudes in June–July.
197.	*Melitaea didyma* Esper.	Common at higher altitudes (4,000–7,000 feet) April–June.
198.	*Atella phalantha* Drury	Seen everywhere in Province in late summer and autumn.
	Lycaenidae	
199.	*Tarucus theophrastus indica* Evans	Common in hills and plains during summer.
200.	*Tarucus nigra* BB.	Common in hills and plains during summer.
201.	*Tarucus mediterraneae* BB.	Common in desert areas in May.
202.	*Azanus ubaldus* Cramer	Rare. Throughout Province May–September on tamarisk flowers.
203.	*Polyommatus pylaon indica* Evans	Not uncommon in April–May at altitudes from 5,500–7,000 feet.
204.	*Polyommatus vicrama astabene* Hemming	Not uncommon in April–May at altitudes from 5,500–7,000 feet.
205.	*Polyommatus christophi bracteata* (Butler)	Common in hilly tracts May–September.
206.	*Polyommatus loewii chamanica* Moore	Very common April–June at higher altitudes.
207.	*Polyommatus sieversi felicia* Evans	Rare. Occurs from 5,500–7,000 feet in May.
208.	*Polyommatus hyrcana kwaja* Evans	Occurs above 6,000 feet May–September.
209.	*Polyommatus iris hanna* Evans	Occurs at 5,000–8,000 feet April–September.
210.	*Polyommatus bogra* Evans	Confined to higher altitudes June–September.
211.	*Polyommatus icarus fugitiva* Butler	Common above 5,000 feet in cultivated areas March–October.
212.	*Polyommatus eros balucha* Moore	Common above 5,000 feet around Quetta May–September.
213.	*Polyommatus eros shingara* Evans	Rare. Found at higher altitudes in September.
214.	*Chilades laius* Cramer	Occurs at Quetta in September.
215.	*Freyeria trochilus* Freyer	Throughout Baluchistan during entire year.
216.	*Zizeeria maha maha* Kollar	Rare. Found at Duki in June.
217.	*Zizeeria lysimon* Hüb.	Found rarely everywhere throughout year.
218.	*Euchrysops contracta contracta* (Butler)	Throughout Province during entire year.
219.	*Euchrysops pandava minuta* Evans	Not common. Found in plains in September; hilly tracts in October.
220.	*Lampides boeticus* Linn.	Common everywhere in Baluchistan throughout year.
221.	*Tomares callimachus* Evers.	Occurs at 7,000 feet March–April.
222.	*Lycaena phlaeas stygianus* Butler	Not very common; found in hilly tracts March–October.
223.	*Lycaena thetis lampon* Led.	Rare. Found at higher altitudes in September.
224.	*Lycaena phoenicurus* Lep.	Occurs at 5,000–6,000 feet May–June.
225.	*Lycaena caspius susanus* Swin.	Rare. Found at higher altitudes May–June.
226.	*Neolycaena connae* Evans	Occurs at 7,000 feet May–June.
227.	*Callophrys rubi* Linn.	Common at 6,000–9,000 feet May–July.
228.	*Strymon sassanides* Kollar	Common from May to early July at 6,000–9,000 feet.
229.	*Apharitis epargyros* Evers.	Common above 6,000 feet.
230.	*Apharitis acamas hypargyros* Butler	Occurs throughout Province May–August.
	Hesperiidae	
231.	*Hasora alexis* Fabr.	Found at Quetta in August–September.
232.	*Gomalia elma litoralis* Swin.	Found at 3,000 feet elevation.
233.	*Syrichtus evanidus* Butler	Common in Makran June–July.
234.	*Syrichtus geron* Watson	Common 5,000–7,000 feet May–September.
235.	*Syrichtus orbifer carnea* Reverd.	From May–July at 6,000–9,000 feet.
236.	*Syrichtus plurimacula* Christoph	Around Ziarat May–August.

237. *Carcharodus dravira balucha* Evans	Common from 6,000–9,000 feet June–July.
238. *Carcharodus alceae swinhoei* Watson	Common March–October above 5,000 feet near cultivation.
239. *Erynnis marloyi* Boisduval	Fairly common from end of March–May at 5,000–7,000 feet.
240. *Baoris mathias thrax* Hüb.	Common in the plains and coastal area.
241. *Gegenes nostrodamus karsana* Moore	Rare. Seen July–October.
242. *Eogenes alcides alcides* H. S.	At higher altitudes June–August.

B—HETEROCERA

Sesiidae

243. *Trochilium ommatiaeforme* Moore	Occurs in uplands during summer.

Gelechiidae

244. *Platyedra gossypiella* Saund.	Throughout cotton-growing tracts.
245. *Sitotroga cerealella* (Oliv.)	Throughout Baluchistan.
246. *Anarsia lineatella* Zeller	Common in uplands; adults from June–September.

Hyponomeutidae

247. *Hyponomeuta padella* Linn.	Confined to higher altitudes in Ziarat Valley; adults in June–July.

Tortricidae

248. *Archips* (*Cacoecia*) *sarcostega* (Meyr.)	Common in orchards of uplands; adults June–September.
249. *Archips* (*Cacoecia*) *subsidiaria* (Meyr.)	Common in orchards of uplands; adults June–September.
250. *Archips* (*Cacoecia*) *pomivora* (Meyr.)	Common in orchards of uplands; adults June–September.
251. *Archips* (*Cacoecia*) *philippa* (Meyr.)	Common in orchards of uplands; adults June–September.

Eucosmidae

252. *Cydia pomonella* (Linn.)	Common in uplands in apple orchards; adults May–July.
253. *Spilonota ocellana* Schiff.	So far confined to Quetta-Pishin District; adults May–June.

Pyralididae

254. *Euzophera punicella* Moore	Common throughout the pomegranate-growing areas; moths from April–August.
255. *Etiella zinckenella* Treit.	Throughout Baluchistan.
256. *Plodia interpunctella* Hüb.	Throughout Baluchistan.
257. *Corcyra cephalonica* (Staint.)	Cosmopolitan; abundant in hilly tracts.
258. *Phycita infusella* Meyr.	Throughout cotton-growing regions.
259. *Sylepta derogata* (Fabr.)	Throughout cotton-growing regions.
260. *Emmalocera depressella* Swin.	Common in plains.
261. *Ephestia kuehniella* Zeller	Throughout Province.
262. *Ephestia cautella* Wlk.	Throughout Province.
263. *Schoenobius bipunctifer* Wlk.	In plains; adults from May–September.
264. *Chilo simplex* Butler	Common in plains; serious pest of jowar.
265. *Botyodes asialis* Guen.	Common in hilly tracts during summer.
266. *Auxacia bilineella* Rag.	Common in hilly tracts during summer.
267. *Nomophila noctuella* Schiff.	Throughout Baluchistan. Common in hilly tracts during summer.
268. *Euchromius ocelleus* Haw.	Common in hills during summer.
269. *Tegostoma disparialis* H. P.	Common in hills during summer.
270. *Noctuelia floralis* Hüb.	Common in hills during summer.
271. *Ommatopteryx ocellea* (Haw.)	Common in hills during summer.

B—Heterocera (*Continued*)

Zygaenidae	
272. *Zygaena afghana* Moore	Common in hills during summer.
Sphingidae	
273. *Theretra alecto alecto* Linn.	Common in uplands; adults swift fliers; common in June–July.
274. *Celerio lineata livornica* Esp.	Common in uplands; adults from March–June.
275. *Celerio euphorbiae robertsi* Butler	Common in uplands; adults from March–June.
276. *Herse convolvuli convolvuli* Linn.	Common up to 7,000 feet in grape-growing areas; adults in April and June–July.
277. *Macroglossum stellatarum* (Linn.)	Common in uplands; moths in April–June.
Geometridae	
278. *Eupithecia unedonata* Mab.	Found in uplands during summer.
279. *Rhodometra sacraria* Linn.	Found in uplands during summer.
Saturniidae	
280. *Saturnia stoliczkana* Feld.	Occurs above 5,500 feet; adults in July–August.
Arctiidae	
281. *Utetheisa pulchella* Linn.	Occurs near seacoast.
282. *Axiopoena maura* Eichw.	Throughout hilly tracts. Adults nocturnal and appear April–July.
Noctuidae	
282a. *Agrotis segetis* Schiff.	Common throughout Province in summer.
283. *Agrotis ypsilon* Rott.	Common throughout Province in summer.
284. *Agrotis conformis* Swin.	Occurs only at Quetta.
285. *Agrotis cespitis* Swin.	Occurs only at Quetta.
286. *Apopestes spectrum* (Esp.)	Common in uplands; adults during April–July.
287. *Caradrina coruscantis* Swin.	Recorded from 3,000–5,500 feet.
288. *Caradrina uniformis* Swin.	Recorded only from Quetta so far.
289. *Tarache sulphuralis* Berget.	Common in uplands.
290. *Catocala afghana* Swin.	Adults at higher altitudes in July.
291. *Aulophila dilucida* Hüb.	Common in uplands.
292. *Euxoa segetum* Schiff.	Throughout hilly tracts.
293. *Heliothis obsoleta* Fabr.	Throughout Province.
294. *Heliothis armigera* Hüb.	Universally distributed; common in Province.
295. *Heliothis peltigera* Schiff.	Recorded from Chagai District.
296. *Eublemma olivacea* Wlk.	Throughout Baluchistan.
297. *Prodenia litura* Fabr.	Throughout Baluchistan.
298. *Laphygma exigua* Hüb.	Recorded from Quetta; adults in July.
299. *Plusia ni* Hüb.	Common in July.
300. *Sarrothripa revayana* Scop.	In uplands; adults in July on poplar trees.
301. *Earias fabia* Stoll.	Throughout cotton-growing areas.
302. *Earias insulana* Boisd.	Throughout cotton-growing areas.
Plutellidae	
303. *Plutella maculipennis* (Curtis)	Common throughout Province; adults from May–September.
Glyphipterygidae	
304. *Phycodes radiata* Ochs.	Throughout uplands where figs are grown.
Lymantriidae	
305. *Euproctis signata* Blan.	Confined to Quetta-Pishin and Zhob Districts; adults in June.
306. *Euproctis fraterna* Moore	So far only recorded from Loralai District; adults in July.
307. *Euproctis guttata* Wlk.	So far only recorded from Loralai District; adults in July.
308. *Euproctis obfuscata* Wlk.	So far only recorded from Loralai District; adults in July.

COLEOPTERA

Cicindelidae

309. *Cicindela sublacerata* Solsky var. *balucha* Bates	Common throughout Province; more abundant in hilly tracts. Adults appear in June–July.
310. *Cicindela lunulata* Fabr.	Common throughout Province; more abundant in hilly tracts. Adults appear in June–July.
311. *Cicindela chiloleuca* Fisch.	Common throughout Province; more abundant in hilly tracts. Adults appear in June–July.
312. *Megacephala euphratica* Dej.	More common in hilly tracts.

Carabidae

313. *Calosoma olivieri* Dej.	Recorded from Quetta-Pishin and Chagai Districts; adults common in April–July.
314. *Omophron rotundatus* Chaud.	Found throughout hilly tracts; adults common in May–August.
315. *Siagona europea* Dej.	Throughout Province; particularly abundant in hilly tracts.
316. *Luperca laevigata* Fabr.	Common in hills and plains.
317. *Scarites cylindronotus* Fald.	So far recorded only from Chagai District; probably also occurs in other areas.
318. *Scarites salinus* Dej.	Throughout plains of Makran, Kharan and Chagai Districts.
319. *Scarites terricola* Bon.	Throughout plains of Makran, Kharan and Chagai Districts.
320. *Scarites subcylindricus* Chaud.	Throughout plains of Makran, Kharan and Chagai Districts.
321. *Scarites nitens* Andrews	Throughout plains of Makran, Kharan and Chagai Districts.
322. *Scarites planus* Bon.	Throughout plains of Makran, Kharan and Chagai Districts.
323. *Scarites sulcatus* Oliv.	Found throughout hilly tracts.
324. *Cymbionotum semelederi* Chaud.	Common throughout Province.
325. *Zabrus morio* Ménétries	Common throughout Province.
326. *Ophonus griseus* Panz.	Common throughout Province.
327. *Amara aenea* De Geer	Occurs only in hilly tracts; beetles common in May–September.
328. *Metabletus fuscomaculatus* Mots.	Occurs only in hilly tracts; beetles common in May–September.
329. *Pheropsophus hilaris* Fabr. var. *desbordei* Maind.	Occurs in hilly tracts; beetles found April–July.
330. *Calosoma auropunctatum* (Payk.)	Occurs in hilly tracts; beetles found April–July.

Dytiscidae

331. *Erestes sticticus* Linn.	Water beetles; common in uplands.
332. *Hydaticus histrio* Clk. var. *rectangulus* Shp.	Water beetles; common in uplands.
333. *Cybister 3-punctatus* Ol.	Water beetles; common in uplands.

Staphylinidae

334. *Physetops giganteus* Sem.	Throughout Baluchistan, but more common in uplands during summer.

Nitidulidae

335. *Carpophilus hemipterus* Linn.	Scavenger beetles; common throughout Province.
336. *Carpophilus dimidiatus* Linn.	Scavenger beetles; common throughout Province.
337. *Carpophilus obsoletus* Er.	Scavenger beetles; common throughout Province.

Cucujidae

338. *Hectarthrum heros* Fabr.	Found in uplands.
339. *Oryzaephilus surinamensis* Linn.	Occurs throughout Province.
340. *Oryzaephilus mercator* (Fauv.)	Occurs throughout Province.
341. *Laemophlaeus minutus* (Oliv.)	Occurs throughout Province.

Coccinellidae

342. *Coccinella 7-punctata* Linn.	Throughout hilly tracts.
343. *Coccinella 11-punctata* Linn.	Throughout hilly tracts.
344. *Chilocorus bipustulatus* Linn.	Throughout hilly tracts.
345. *Epilachna 28-punctata* Fabr.	Throughout hilly tracts.

Hydrophilidae

346. *Hydrophilus indicus* Bedel	Common in hilly tracts.

Buprestidae

347. *Capnodis kashmirensis* Frm.	Adults common June–August in upland orchards.
348. *Capnodis miliaris* Klug	Adults common June–August in upland orchards.
349. *Capnodis parumstriata* Ball.	Adults common June–August in upland orchards.
350. *Sphenoptera tappesi* Mars.	Common in hilly tracts; adults in June–July.
351. *Julodis whithilli* Gray	In hilly tracts in vegetable fields.

Elateridae

352. *Agriotes meticulosus* Cand.	Occurs at Quetta and Ziarat.
353. *Agrypnus moestus* Cand.	Occurs at Quetta and Ziarat.

Tenebrionidae

354. *Dila laevicollis* Gebl.	Occurs in hilly tracts during summer.
355. *Pimelia tricostata* Gebl.	Occurs in hilly tracts during summer.
356. *Blaps fuscinosa* Seidl.	Common in hilly tracts during summer.
357. *Ocnera philistina* Rch.	Common in hilly tracts during summer.
358. *Cyphogenia gibba* Fald. var. *persica* Baudi.	Common in upland orchards during summer.
359. *Cyphogenia plana* B.	Common in upland orchards during summer.
360. *Zophosis punctata* Br.	Common in hilly areas during summer.
361. *Gonocephalum planatum* Wlk.	Common in hilly areas during summer.
362. *Adesmia sodalis* Waterh.	Common in upland orchards.
363. *Adesmia fagergremi* Band.	Common in upland orchards.
364. *Tribolium castaneum* Herbst	Widely distributed throughout Province.
365. *Tribolium confusum* Jacq. du V.	Widely distributed throughout Province.
366. *Latheticus oryzae* Waterh.	Common throughout Baluchistan.

Chrysomelidae

367. *Plagiodera versicolor* Laich.	Throughout uplands; adults common June–August.
368. *Aulacophora foveicollis* (Lucas)	Common both in hills and plains.
369. *Aulacophora abdominalis* Fabr.	Common both in hills and plains.
370. *Aulacophora atripennis* Fabr.	Not very common; in hilly tracts.
371. *Labidostomis cummingi* Jacoby	Not very common; only in uplands.
372. *Entomoscalis berytensis* Rch.	Not common; only in uplands.
373. *Hispa armigera* Oliv.	Wherever rice is cultivated; not a serious pest.

Cerambycidae

374. *Prionus ellioti* Gahan	So far recorded only from Quetta (5,500 feet) attacking poplar trees. Adults found June–September.
375. *Apatophysis modica* Gahan	Not very common. Confined to Quetta-Pishin District; adults common June–August.
376. *Oxymirus cursor* Linn.	Not very common. Confined to Quetta-Pishin District; adults common June–August.
377. *Diorthus simplex* White	Not very common. On coast; adults in May–August.
378. *Derolus mauritanicus* Buquet	Recorded from coast. Adults collected in June.
379. *Quettania coeruleipennis* Schwar.	Occurs in hilly tracts; more common in Loralai. Adults appear in summer.
380. *Macrotoma crenata* Fabr.	Throughout plains and uplands; adults in June–September.
381. *Aeolesthes sarta* Solsky	Throughout uplands; adults common from June–August.

Lamiinae

382. *Batocera rufomaculata* De Geer	In uplands wherever figs are cultivated.

Curculionidae

383. *Blosyrodes pubescens* Marshall	Throughout uplands above 5,000 feet.
384. *Tanymecus mandibularis* Marshall	Throughout hilly tracts. Not very common.

385. *Leptomias porcellus* Marshall	So far recorded only from Chagai District.
386. *Leptomias cylindricus* Marshall	Common in hilly tracts.
387. *Dereodus pollinosus* Redt.	Not very common. Recorded from above 5,000 feet.
388. *Otiorrhynchus peregrinus* Marshall	Not very common in uplands. Occurs only in Baluchistan.
389. *Polydrusus obliquatus* Fst.	Common in upland orchards.
390. *Ammocleonus aschabadensis* Fst.	Common in upland orchards.
391. *Sitophilus oryzae* (Linn.)	Throughout Province.
392. *Sitophilus granaria* Linn.	Throughout Province.
393. *Phacephorus argyrostomus* Gyl.	Occurs in plains where it is widely distributed.
394. *Rhynchophorus ferrugineus* Fabr.	Occurs wherever dates are grown; more common in Makran and Kharan.
395. *Cryptorrhynchus mangifera* Fabr.	Occurs wherever mangoes are grown; more common in Makran and Sibi.
396. *Myllocerus 11-pustulatus* var. *maculosus* Desbr.	Recorded from Loralai District damaging pods of pulses.

Scolytidae

397. *Scolytus amygdalae* Guér.	Common in uplands attacking orchard trees.
398. *Scolytus fasciatus* Rtt.	Rare. In uplands attacking fruit trees.

Scarabaeidae

A—CETONIINAE

399. *Aethiessa bagdadensis* Burm.	Abundant in uplands.
400. *Epicometis* (*Tropinota*) *squalida* (Linn.)	Common in uplands; adults appear in March–April.
401. *Epicometis* (*Tropinota*) *turanica* Rtt.	Common in uplands; adults appear in March–April.
402. *Stalagmosoma albella* Pall.	Common in uplands; adults appear in March–April.
403. *Protaetia impavida* Jans.	Not very common. Occurs in Quetta-Pishin District.
404. *Protaetia affinis* Anders.	Not very common. Occurs in Quetta-Pishin District.
405. *Oxythyrea cinctella* Sch.	Not very common. Occurs in Quetta-Pishin District.

B—DYNASTINAE

406. *Oryctes nasicornis* Linn. var. *gryphus* Ill.	Throughout hilly tracts. Adults common during summer; attracted to light at night.
407. *Pentodon bispinifrons* Rtt.	Throughout hilly tracts. Adults common during summer; attracted to light at night.
408. *Pentodon idiota* Herbst	Throughout hilly tracts. Adults common during summer; attracted by light.
409. *Xylotrupes gideon* Linn.	Not very common. Occurs in hilly tracts.
410. *Xylotrupes mniszechi* Thomas	Not very common. Occurs in hilly tracts.
411. *Phyllognathus silenus* Fabr.	Common in hilly tracts; adults attracted by light.
412. *Phyllognathus excavatus* Forst.	Common in hilly tracts; adults attracted by light.
413. *Phyllognathus dionysius* Fabr.	Common in hilly tracts; adults attracted by light.

C—MELOLONTHINAE

414. *Polyphylla adspersa* Mots.	Common in hilly tracts; adults attracted to light in large numbers.

D—RUTELINAE

415. *Tropiorrhynchus orientalis* Newm.	Common in uplands during summer.
416. *Rhinyptia suturalis* Kraatz	Common in uplands during summer.
417. *Phaeadoretus comptus* Ménétries	Occurs throughout Province; very common in plains.
418. *Pseudadoratus dilutellus* Sem.	Not very common. Found in uplands.
419. *Adoretus brachypygus* Burm.	Common in hilly tracts; adults attracted to light.
420. *Adoretus flavus* Arr.	Common in hilly tracts; adults attracted to light.

E—GEOTRUPINAE

421. *Bolboceras* sp.	Very rare. Found only in uplands.

F—APHODIINAE

422. *Aphodius brunneus* Klug	Common throughout Province; more abundant in hilly tracts.
423. *Aphodius pubescens* Sturm	Common throughout Province; more abundant in hilly tracts.
424. *Rhyssemus germanus* Linn.	Common throughout Province; more abundant in hilly tracts.

G—COPRINAE

425. *Scarabaeus sacer* Linn.	Throughout Province; more common in the uplands during summer.
426. *Copris hispanus* Linn.	Throughout Province; more common in the uplands during summer.
427. *Gymnopleurus flagellatus* Fabr.	Throughout Province; more common in the uplands during summer.
428. *Chironitis osiridis* Reiche	Rare. Found only in uplands.
429. *Heliocopris gigas* Linn.	Rare. Found only in uplands.

Bruchidae

430. *Pachymerus* (*Bruchus*) *chinensis* (Linn.)	Throughout Province; more common in plains.
431. *Laria* (*Bruchus*) *affinis* Fröl.	Throughout Province; more common in plains.

Dermestidae

432. *Trogoderma granaria* Everts	Throughout Baluchistan.
433. *Trogoderma versicolor* Creutz.	Not very common. Occurs throughout Province.
434. *Attagenus piceus* (Oliv.)	Common in hilly tracts.
435. *Attagenus lobatus* Ros.	Common in hilly tracts.

Bostrychidae

436. *Rhizopertha dominica* (Fabr.)	Throughout Province.

Trogositidae

437. *Tenebrioides mauritanicus* (Linn.)	Confined to hilly tracts.

HYMENOPTERA

Tenthredinidae

438. *Nematis orientalis* Cameron	Collected at Quetta during August.

Evaniidae

439. *Evania nurseana* Cameron	Collected at Quetta in June and August.
440. *Gasteruption baluchistanense* Cameron	Found at Quetta during May–July.
441. *Gasteruption quettaensis* Cameron	Recorded from Quetta May–August.

Ichneumonidae

442. *Bassus laelatorius* Fabr.	Common in Quetta-Pishin District April–June.
443. *Exetastes nitidus* Cameron	Collected at Quetta in May.
444. *Ophion carinatus* Cameron	Recorded from Pishin in May.
445. *Ophion peshinensis* Cameron	Recorded from Pishin in April.
446. *Ophion quettaensis* Cameron	Recorded from Pishin in April.
447. *Nototrachus rufo-orbitalis* Cameron	Recorded from Quetta in May.
448. *Tranosema striata* Cameron	Recorded from Pishin in April.
449. *Tranosema spilostoma* Cameron	Recorded from Pishin in April.
450. *Barylypa pilosella* Cameron	Recorded from Quetta in May.
451. *Barylypa interstitialis* Cameron	Recorded from Quetta in August.
452. *Barylypa rufo-lineata* Cameron	Recorded from Quetta in August.
453. *Barylypa variornata* Cameron	Recorded from Quetta in June–August.
454. *Barylypa erythrocera* Cameron	Recorded from Quetta in August.

455. *Limnerium quettaensis* Cameron	Common in Quetta from April–June.
456. *Limnerium forticarinatum* Cameron	Recorded from Quetta March–August.
457. *Limnerium parvicarinatum* Cameron	Recorded from Quetta in June.
458. *Paurolexis flavus* Cameron	Occurs at Quetta from June–July.
459. *Pimpla nursei* Cameron	Rare. Recorded from Quetta in May.
460. *Lassonota baluchistanensis* Cameron	Occurs at Quetta in July.
461. *Cryptus violaceotinctus* Cameron	Recorded from Quetta in April.
462. *Phaedrophadnus striatus* Cameron	Recorded from Quetta in May–June.
463. *Mesostenus tricarinatus* Cameron	Collected at Quetta in May.
464. *Fileanta rufo-cauda* Cameron	Collected at Quetta in May.
465. *Epyris rugicollis* Cameron	Collected at Quetta from June–August.

Braconidae

466. *Protapanteles nigrescens* Cameron	Recorded at Quetta in August.
467. *Cardiochiles nigricollis* Cameron	Recorded at Quetta in May.
468. *Cardiochiles erythronotus* Cameron	Recorded at Quetta in May.
469. *Chelonus areolatus* Cameron	Recorded at Quetta in May.
470. *Chelonus fortispinus* Cameron	Recorded at Quetta in August.
471. *Macrocentrus rufo-testaceus* Cameron	Recorded at Quetta in July.
472. *Macrocentrus fuscipes* Cameron	Recorded at Quetta in May.
473. *Orgilus nigromaculatus* Cameron	Recorded at Quetta in May.
474. *Bracon quettaensis* Cameron	Recorded from Quetta in May–August.
475. *Bracon iridipennis* Cameron	Recorded at Quetta in May.
476. *Vipio nursei* Cameron	Occurs at Quetta from June–August.
477. *Vipio unicolor* Cameron	Common at Quetta in August.
478. *Glyptomorpha nursei* Cameron	Rare. Collected at Pishin in May.
479. *Amicroplus rufotestaceus* Cameron	Rare. Parasite. Found in June.

Chalcididae

480. *Leucaspis quettaensis* Cameron	Rare. Recorded at Quetta in August.
481. *Leucaspis nursei* Cameron	Occurs at Quetta from May–August.
482. *Dirrhinus erythroceras* Cameron	Recorded at Quetta in May.
483. *Megacolus pruinosus* Cameron	Rare. Recorded at Quetta in August.
484. *Chalcis responsator* Cameron	Recorded at Quetta in May.
485. *Chalcis fulvitarsis* Cameron	Recorded at Quetta in May.
486. *Oncochalcis quettaensis* Cameron	Recorded from Quetta-Pishin District June–August.
487. *Oncochalcis rufescens* Cameron	Recorded from Quetta in June.
488. *Oncochalcis fulvitarsus* Cameron	Recorded from Quetta in May.
489. *Neochalcis forticaudis* Cameron	Recorded from Quetta in August.
490. *Etroxys xanthopus* Cameron	Collected in June in Quetta-Pishin District.
491. *Etroxys marginicollis* Cameron	Collected at Quetta in June.
492. *Brachymeria intermedia* Nees	Rare. Parasite.

Scelionidae

493. *Sparasion albo-pilosellus* Cameron	Collected in May at Quetta.

Encyrtidae

494. *Paralitomastix varicornis* Nees	Rare. Parasite.

Pteromalidae

495. *Dibrachya cavus* Wlk.	Rare. Parasite.
496. *Pachyneuron nazeeri* Mani	Rare. Parasite.

Formicidae

497. *Myrmecocystus setipes* Ford	Common throughout Baluchistan; more common in hilly tracts.
498. *Tetramorium nursei* Bing.	Common in uplands.

Scoliidae

499. *Plesia baluchistanensis* Cameron	Very common May–July in Quetta-Pishin District.
500. *Plesia subpetiolatus* Cameron	Common from May–August at Quetta.
501. *Scolia quettaensis* Cameron	Common from May–August at Quetta.
502. *Scolia maura* Cameron	Common from May–August at Quetta.
503. *Myzina orientalis* Smith	Common everywhere in Province.

Bethylidae

504. *Epyria rugicollis* Cameron	Common from June–August.
505. *Perisierola* sp.	Rare. Parasite.

Chrysididae

506. *Holopyga gloriosa* (Fabr.) var. *viridis* (Guér.)	Common at Quetta in April–May.
507. *Stilbum cymurum* Forst.	Common at Quetta in May–June.
508. *Chrysis stilboides* (Spin.)	Common at Quetta in May–June.
509. *Chrysis pulchella* (Spin.)	Common at Quetta in May–June.
510. *Chrysis chlorochrisa* (Mocs.)	Common at Quetta in April.
511. *Chrysis dentipes* (Rad.)	Rare. Collected at Quetta in May.
512. *Chrysis pesitacina* (Buyss.)	Rare. Collected at Quetta in May.
513. *Chrysis sara* Nurse	Rare. Collected at Quetta in April.
514. *Chrysis deposita* Nurse	Rare. Collected at Quetta in April.
515. *Chrysis urana* Nurse	Common at Quetta during spring.
516. *Chrysis reparata* Nurse	Not uncommon in Quetta-Pishin District in May–August.
517. *Euchroeoides oblatus* Nurse	Rare. Recorded from Quetta.
518. *Astata lucinda* Nurse	Common at Quetta in April–June.
519. *Ecmenes montana* Nurse	Common at Quetta in spring.
520. *Hedychrum lama* (Buyss.)	Not uncommon at Quetta in May–June.
521. *Hedychrum monochroum* (Buyss.)	Rare. Collected at Quetta in May.
522. *Hedychrum pulchella* (Spin.)	Rare. Collected at Quetta in May.
523. *Euchrocus purpuratus* (Fabr.)	Fairly common in Quetta-Pishin.
524. *Parnopes varellesi* (Buyss.)	Rare. Collected at Quetta.

Eumenidae

525. *Eumenes affinissima* Saus., race *quettaensis* Cameron	Common at Quetta from May–July.
526. *Eumenes montana* Nurse	Rare. Collected at Quetta in April.
527. *Odynerus* (*Ancistrocerus*) *leucospilus* Cameron	Rare. Collected at Quetta in July.
528. *Odynerus* (*Ancistrocerus*) *quettaensis* Cameron	Rare. Collected at Quetta in July.
529. *Odynerus* (*Ancistrocerus*) *baluchistanensis* Cameron	Rare. Collected at Quetta in July.

Vespidae

530. *Polistes hebraicus* Fabr.	Very common throughout Province during summer and winter.
531. *Polistes gallicus* Linn.	Very common throughout Province during summer and winter.
532. *Vespa orientalis* Fabr.	Very common throughout Province.
533. *Vespa bicolor* Fabr.	Common throughout Province; more common in hilly tracts.
534. *Vespa germanica* Fabr.	Common in hilly tracts.

Sphegidae

535. *Astata quettae* Nurse	Common. Collected in Quetta, Mastung and Loralai in April from orchards.

536. *Homogambrus creon* Nurse	Collected only from Quetta in April.
537. *Homogambrus menelaus* Nurse	Collected in Quetta, Pishin and Gulistan from orchards in June.
538. *Larra neaera* Nurse	Common in Quetta orchards April–May.
539. *Miscophus quettaensis* Nurse	Collected from orchards in Quetta-Pishin and Loralai Districts in April.
540. *Miscophus difficilis* Nurse	Common on blossoming trees in April in Quetta-Pishin District.
541. *Trypoxylon mediator* Nurse	Rare. Collected from Quetta in April.
542. *Ammophila bolanica* Nurse	Not very common in Quetta-Pishin District. Collected in April–May.
543. *Sphex fragilis* Nurse	Common in orchards in Quetta-Pishin and Loralai Districts in April–May.
544. *Sphex retractus* Nurse	Not very common. Collected at Quetta in April.
545. *Diodontus tenuis* Nurse	Common in Quetta-Pishin District in April–May.
546. *Diodontus selectus* Nurse	Common in Quetta-Pishin District in April–May.
547. *Diodontus rusticus* Nurse	Common in Quetta-Pishin District in orchards and houses March–June.
548. *Crabro balucha* Nurse	Common at Quetta in March–June.
549. *Crabro prosopiformis* Nurse	Fairly common in Quetta-Pishin District in orchards, houses, etc., in March–May.
550. *Chlorion regalis* Sm.	Common in hilly tracts in March–June.
551. *Ammophila hirsuta* Scop. var. *mervensis* Rad.	Rare. Collected at Quetta in May.
552. *Ammophila laeta* Bing.	Rare. Collected at Quetta in May.
553. *Ammophila mandibulata* Kirby	Rare. Collected at Quetta in May.

Xylocopidae

554. *Xylocopa aestuans* Linn.	Common in hilly tracts.
555. *Xylocopa violacea* Fabr.	Common in uplands.
556. *Xylocopa olivieri* Lep.	Common in uplands.

Apidae

557. *Andrena spinigera* Kirby	Common at Quetta in March–April on fruit tree blossoms.
558. *Andrena convexiuscula* (Kirby)	Common in uplands during spring.
559. *Andrena tenuis* (Mor.)	Not common. Recorded only from Quetta and Pishin during April–May on tree blossoms.
560. *Andrena parvula* (Kirby)	Common in uplands during spring.
561. *Andrena nigriceps* (Kirby)	Found in uplands on tree blossoms during spring.
562. *Andrena minutula* (Kirby)	Recorded from Quetta-Pishin District in April on apple blossoms.
563. *Andrena unita* Nurse	Rare. Recorded on cherry blossoms in April at Quetta and Pishin.
564. *Andrena balucha* Nurse	Common in the Quetta-Pishin District, especially in lucerne fields, in April–May.
565. *Andrena peshinica* Nurse	Fairly common in orchards of Quetta-Pishin District during March–April.
566. *Andrena niveo-barbata* Nurse	Rare. Collected at Quetta from cherry blossom in March.
567. *Andrena cara* Nurse	Fairly common during April in upland orchards.
568. *Andrena hera* Nurse	Rare. Collected at Quetta in April.
569. *Andrena flavo-facies* Nurse	Common in orchards of Quetta-Pishin District during April–May.
570. *Andrena marmora* Nurse	In fairly large numbers in Quetta-Pishin District during April–May in cultivated fields and orchards.
571. *Andrena dolorosa* Nurse	Rare. Collected from Quetta and Pishin in March–April.
572. *Andrena collata* Nurse	Not very common. Found in uplands in April.
573. *Andrena legata* Nurse	Collected from Quetta-Pishin District in April.
574. *Andrena bi-emarginata* Nurse	Collected from Quetta-Pishin District in April.
575. *Andrena flagella* Nurse	Rare. Collected at Quetta in April.
576. *Andrena halictoides* Nurse	Common in orchards of Quetta-Pishin District during April.
577. *Andrena satellita* Nurse	Not uncommon in Quetta-Pishin District during March–May.
578. *Melanapis rufifrons* Nurse	Common at Quetta in April–May.
579. *Ammobates solitarius* Nurse	Common at Quetta during spring.
580. *Nomada detecta* Nurse	Fairly common in Quetta-Pishin District during spring.

581.	*Pasites maculatus* (Jur.)	Recorded at Quetta in spring.
582.	*Epeolus pictus* (Nyl.)	Recorded at Quetta in spring.
583.	*Ctenoapis lutea* (Cam.)	Recorded at Quetta in spring.
584.	*Nomada coxalis* (Mor.)	Recorded at Quetta in spring.
585.	*Nomada distinguenda* (Mor.)	Recorded at Quetta in spring.
586.	*Nomada furva* (Panzer)	Recorded at Quetta in spring.
587.	*Nomada mutica* (Mor.)	Recorded at Quetta in spring.
588.	*Systropha planidens* (Giraud)	Recorded at Quetta in spring.
589.	*Osmia sponsa* Nurse	Not uncommon at Quetta during spring.
590.	*Osmia balucha* Nurse	Fairly common in March throughout uplands.
591.	*Osmia sita* Nurse	Not uncommon in uplands in May.
592.	*Megachile asiatica* (Mor.)	Common in Quetta-Pishin District during spring.
593.	*Megachile apiculis* (Spin.)	Rare. Found at Quetta in spring.
594.	*Megachile rotundata* (Fabr.)	Rare. Found at Quetta in spring.
595.	*Megachile desertorum* (Mor.)	Rare. Found at Quetta in spring.
596.	*Megachile muraria* (Retz.)	Fairly common at Quetta in spring.
597.	*Anthidium saltator* (Nurse)	Rare. Found at Quetta in spring.
598.	*Anthidium florentinum* (Fabr.) var. *caucasicum*	Common in lucerne fields at Quetta.
599.	*Anthidium fedtschenkoi* (Mor.)	Rare. Collected at Quetta in April.
600.	*Camptopoeum rufiventra* (Mor.)	Common at Quetta in April–May; probably more widespread.
601.	*Ceratina ino* Nurse	Common on tamarisk flowers wherever this plant grows in uplands from April–May.
602.	*Ceratina egeria* Nurse	Common on tamarisk flowers wherever this plant grows in uplands from April–May.
603.	*Ceratina corrina* Nurse	Common on tamarisk flowers wherever this plant grows in uplands from April–May.
604.	*Ceratina laevifrons* (Mor.)	Rare. Collected at Quetta in May.
605.	*Crocisa elegans* (Mor.)	Fairly common at Quetta during spring.
606.	*Eucera melanostoma* (Mor.)	Rare. Collected at Quetta in May.
607.	*Eucera spectabilis* (Mor.)	Common at Quetta in May.
608.	*Eucera turcestarnica* (Dalla Tor.)	Rare. Collected from Chaman in April.
609.	*Eucera medusa* Nurse	Not uncommon during spring in Quetta-Pishin District.
610.	*Eucera* (*Macrocera*) *pomona* Nurse	Extremely common on fruit tree blossoms in March in uplands.
611.	*Eucera* (*Macrocera*) *cassandra* Nurse	Common in May in Quetta-Pishin District.
612.	*Podalirius vedettus* Nurse	Common in March–April in Quetta-Pishin District.
613.	*Podalirius connexus* Nurse	Common on fruit tree blossoms in early spring in Quetta-Pishin District.
614.	*Podalirius sergius* Nurse	Common on fruit tree blossoms in early spring in Quetta-Pishin District.
615.	*Podalirius picicornis* (Feld.)	Common at Quetta in spring.
616.	*Podalirius albigenus* (Lep.)	Common at Quetta in spring.
617.	*Podalirius orientalis* (Mor.)	Common at Quetta in spring.
618.	*Podalirius fulvitarsis* (Brullé)	Common at Quetta in spring.
619.	*Podalirius atricillus* (Evermann)	Common at Quetta in spring.
620.	*Podalirius velocissimus* (Fedt.)	Common at Quetta in spring.
621.	*Melecta plurionotata* Brullé	Common on blossoms in uplands in March.
622.	*Tetralonia vernalis* Mor.	Not very common. Collected in Quetta.
623.	*Anthophora candida* Smith	Not very common. Collected in Quetta.

DIPTERA

Stratiomyiidae

624.	*Stratiosphecomyia variegata* Brun.	From 1,000–5,000 feet. Adults collected during May.
625.	*Clitellaria bistriata* Brun.	Occurs from 4,000–6,000 feet. Adults common in May.

626. *Lasiopa villosa* F. var. *himalayensis* Brun.	Rare. Collected at Quetta (5,500 feet) in May–June. Occurs up to 8,000 feet.
627. *Oxycera albomicans* Brun.	Adults collected from Pishin (5,500 feet) during June on rose flowers.
628. *Stratiomyia barca* Walk.	From 4,500–6,000 feet. Adults found July–September.
629. *Stratiomyia fulvescens* Brun.	Collected from Fort Sandeman (4,700 feet) in May. Common on grassy lawns.
630. *Odontomyia kashmirensis* Brun.	Rare. Adults collected July–September at 5,000 feet on *Euphorbia* plants.
631. *Ptecticus aurifer* Walk.	Common species from 1,000–6,500 feet. Adults collected April–June.
632. *Sargus metallinus* Fabr.	Common and widely distributed in Baluchistan in May and July–October up to 5,000 feet.
633. *Microchrysa flaviventris* Wied.	Found breeding freely in cow dung and decaying vegetable matter. Occurs in plains June–October.
634. *Xylomyia calopodata* Big.	Collected from old trees and decaying wood during June from 5,000–6,000 feet.

Cyrtidae

635. *Philopota viridaenea* Brun.	Adults collected in May from Ziarat (8,000 feet) from shady places on trunks and branches of trees.
638. *Pterodontia kashmirensis* Licht.	Rare. Collected at Mastung in May sitting on apple tree trunk.

Bombyliidae

639. *Exoprosopa pennipes* Wied.	Adults collected from coastal areas May–June.
640. *Argyramoeba claripennis* Brun.	Collected at Sibi in May from a citrus tree.
641. *Argyramoeba niveisquamis* Brun.	Common in upland orchards April–June.
642. *Anthrax himalayanus* Brun.	Collected in May from wild flowers at Quetta. Flight of adults short but swift.
643. *Anthrax afra* Fabr.	Widely distributed species in Baluchistan March–August. More common in hilly and sandy tracts.
644. *Anthrax manifesta* Walk.	Rare. Collected from Quetta in May and Loralai in November.
645. *Anthrax baluchianus* Brun.	Widely distributed in Province. Occurs in plains, hilly, and desert tracts. Common from April–September.
646. *Empidideicus indicus* Brun.	Rare. Collected from Ziarat (8,000 feet) in May on flowers.
647. *Usia sedophila* Brun.	Collected at Quetta in May; common on ornamental flowers.

Empididae

648. *Empis albohalteralis* Brun.	Rare. Collected at Ziarat (8,000 feet) from apple tree.
649. *Hilara compacta* Brun.	Adults collected in May at Quetta preying on small *Diptera* and other soft insects.
650. *Hilara peshawarensis* Brun.	Not common. Adults collected in March at Mach preying on other insects.
651. *Microdromia dorsalis* Brun.	Collected at Quetta in May from a *karez*.

Syrphidae

652. *Paragus rufiventris* Brun.	Common in uplands April–August in orchards; particularly abundant around aphid-infested trees.
653. *Paragus luteus* Brun.	Collected during June at Quetta.
654. *Paragus tibialis* Fln.	Widely distributed in Province during hotter months.
655. *Paragus bicolor* Fabr.	Common in uplands April–August. Adults attracted by fermented fruits.
656. *Dideoides annandalei* Brun.	Collected from a garden in Nushki, Chagai District.
657. *Asarcina ericetorum* Fabr.	Widely distributed in Baluchistan both in hills and plains throughout greater part of year.
658. *Asarcina aegrota* Fabr.	Widely distributed in Baluchistan both in hills and plains throughout greater part of year.
659. *Lasiopticus latimaculatus* Brun.	Common on grass from 2,000–5,000 feet from March–June.
660. *Syrphus albostriatus* Fln.	Common in hilly tracts in orchards during April–August.
661. *Syrphus serarius* Wied.	Common from 3,000–6,000 feet from March–September.

662. *Syrphus balteatus* De Geer	Common in uplands and plains during the greater part of warm weather.
663. *Syrphus fulvifacies* Brun.	Not very common in uplands. Collected from Quetta-Pishin District April–August.
664. *Syrphus confrater* Wied.	Collected from aphid colonies on cabbages, etc., in uplands during April–July.
665. *Eristalis taphicus* Wied.	Common in uplands from March–September on trees infected with aphids.
666. *Eristalis tenax* Linn.	Common almost everywhere throughout summer in hills and plains.
667. *Eristalis arbustorum* Linn.	Common almost everywhere throughout summer in hills and plains.
668. *Eristalis arvorum* Fabr.	Common almost everywhere throughout summer in hills and plains.
669. *Eristalis taeniops* Wied.	Recorded from Quetta-Pishin District in April–May on almond trees infested with aphids.
670. *Eristalis tabanoides* Jaenn.	Collected from peach tree at Quetta in June; probably more widely distributed.
671. *Merodon pallidus* Macq.	Not common. Collected at Quetta during June–August in various orchards.
672. *Xylota dimidiata* Brun.	Rare. Collected from Ziarat (8,000 feet) during May.
673. *Criorrhina interrupta* Brun.	Rare. Collected from Ziarat (8,000 feet) during May.
674. *Ceria dimidiatipennis* Brun.	Collected from forest plantations at Quetta during May–June.
675. *Ceria eumenioides* Saund.	Collected from forest plantations at Quetta during May–June.
676. *Lasiopticus albomaculatus* Macq.	Rare. Collected at Quetta in May.

Conopidae

677. *Conops claripennis* Brun.	Found in Quetta-Pishin District during June–July.
678. *Physocephala nigrofasciata* Brun.	Rare. Collected at Quetta in April.
679. *Physocephala rufescens* Brun.	Rare. Collected at Quetta in May.
680. *Physocephala nursei* Brun.	Rare. Collected at Quetta in May.
681. *Physocephala munda* Brun.	Collected from Quetta-Pishin District in April–July.
682. *Physocephala calopus* Big.	Collected at Quetta in May.
683. *Physocephala tenella* Big.	Rare. Recorded from Quetta in June.
684. *Myopa picta* Panz.	Collected at Quetta in March. Adult sluggish.

Oestridae

685. *Cephalomyia maculata* Wied.	Occurs at places where camels are numerous; larvae attack camels.
686. *Gastrophilus equi* Clark	Flies hovering around horses. Collected in April. Larvae attack horses.

Calliphoridae

687. *Calliphora erythrocephala* (Meig.)	Breeds in decaying matter. Collected from Quetta-Pishin and Chagai Districts in June–August.
688. *Calliphora pattoni* Aub.	From 4,000–8,000 feet; common during April–July. Larviparous.
689. *Hemipyrellia pulchra* Wied.	Adults collected on ripe fruit and flowers. Breeds in human excrement or decomposing carcasses of animals and birds.
690. *Lucilia porpyrina* Wlk.	Common on house verandas. Adults collected in May–July from 5,000–6,000 feet.
691. *Lucilia sericata* (Meig.)	Sheep maggot fly. Common in uplands May–June.
692. *Bengalia jejuna* (Fabr.)	Throughout plains. Adults common on animals during summer months.
693. *Bengalia xanthopyga* (Senior-White)	Not common. Adults collected from an abandoned house in May.
695. *Pollenia rudis* (Fabr.)	Adults collected from a building in May.
696. *Pollenia hazarae* (Senior-White)	Occurs at 4,000–6,000 feet during May–July.
697. *Chrysomyia marginalis* (Wied.)	Common in uplands April–July; often found in the houses.
698. *Chrysomyia megacephala* (Fabr.)	Very common throughout Province. Adults swarm on meat and on sweets.
699. *Chrysomyia rufifacies* (Macq.)	Common in uplands May–July; mainly concentrated on decaying matter.

700. *Chrysomyia albiceps* (Wied.)	Extremely common in plains and uplands April–July; adults attracted to sweets, meat, etc.
701. *Rhynchomyia callopis* Loew	Collected from uplands in May–June. Adults visiting flowers.
702. *Stomorhina lunata* (Fabr.)	Rare. Recorded from Quetta-Pishin District having been bred from eggs of *Orthoptera.*
703. *Sarcophaga ruficornis* (Fabr.)	Widely distributed in Province; adults collected May–August hovering on meat, etc.
704. *Sarcophaga haemorrhoidalis* (Fallen)	Throughout Province; adults attracted to human excrement.

Culicidae

705. *Theobaldia longiareolata* (Macq.)	Collected from upland pools and ponds.
706. *Aedes (Ochlerotatus) caspius* (Pallas)	Collected from upland natural ponds.
707. *Aedes (Finlaya) pseudotaeniatus* (Giles)	Common in plains and hilly tracts. Recorded from tree holes, rock ponds, etc.
708. *Culex (Culex) theileri* Theobald	Throughout Baluchistan. Collected from streams, pools, etc.
709. *Culex (Culex) univittatus* Theobald	Recorded from Quetta in shallow wells, *karezes*, stagnant drains.
710. *Anopheles lindesayi* Giles	Found in houses from 4,000–8,000 feet.
711. *Anopheles dthali* Patton	Found in upland houses.
712. *Anopheles culicifacies* Giles	Found in upland houses.
713. *Anopheles fluviatilis* James	Found in upland houses.
714. *Anopheles subpictus* Grassi	Common in houses in uplands.
715. *Anopheles multicolor* Camboulin	Common in houses in uplands.
716. *Anopheles superpictus* Grassi	Common in houses in uplands.
717. *Anopheles moghulensis* Christopher	Breed in *karezes* at 6,000 feet.
718. *Anopheles splendidus* Koidzuni	Breed in *karezes* at 6,000 feet.
719. *Anopheles pulcherrimus* Theobald	Throughout uplands in houses.

Psychodidae

720. *Phlebotomus minutus* Rond.	Common in shady places in uplands.
721. *Phlebotomus papatassi* Scop.	Common in shady places in uplands.

Bibionidae

722. *Bibio hortulanoides* Brun.	In swarms in cultivated fields during May–June in uplands.

Simuliidae

723. *Simulium stevensoni* Edw.	Attack livestock.

Asilidae

724. *Machimus indianus* Ric.	Common in hills during summer.

Drosophilidae

725. *Drosophila melanogaster* (Meigen)	Very common in hilly tracts. Adults attracted to fermented and rotting fruits.

Ephydridae

726. *Paralimna hirticornis* Meij.	Common in hilly tracts during summer.
727. *Brachydentra longipes* Hand.	Common in hilly tracts during summer.
728. *Scatella stagnalis* Fabr.	Common in hilly tracts during summer.

Chloropidae

729. *Thaumatomyia sulcifrons* Beck.	Attracted to aphid honey-dew. Common in uplands April–August.

Trypetidae

730. *Dacus (Strumeta) ferrugineus* Fabr.	Common in hilly tracts during summer. Serious pest of fruits, etc.

731. *Dacus* (*Strumeta*) *zonatus* Saund.	Common in hilly tracts during summer. Serious pest of fruits, etc.
732. *Dacus* (*Strumeta*) *cucurbitae* Coq.	Common in Province; serious pest of agricultural products.
733. *Dacus* (*Strumeta*) *ciliatus* Loew	Common in hilly tracts during summer damaging ripe fruit.
734. *Myiopardalis pardalina* Big.	Common in hilly tracts. Serious pest.
735. *Trypanea stellata* Fuessly.	Common. Attracted to aphid honey-dew.

Ortalidae

736. *Chrysomyza demandata* Fabr.	Common in orchards during summer.

Hippoboscidae

737. *Hippobosca maculata* Leach	Found in crowds on livestock in uplands.
738. *Hippobosca camelina* Leach	Found in crowds on livestock in uplands.

APPENDIX I: BRACHIOPODA FROM THE SALT RANGE

THE FOLLOWING specimens were obtained during the Peabody Museum-Harvard Expedition to West Pakistan, 1955, by Dr. Henry Field from the Geological Survey of Pakistan, Quetta.

This Permian series was collected and identified by Dr. M. H. Khan of the Geological Survey; the numbers refer to their catalog cards.

No.	*Name*	*Locality*
A 219	*Hemiptychina himalayensis* Davidson	Mohra
A 220	*Hemiptychina inflata* Waagen	Burikhel, Mohra
A 223	*Notothyris djoulfensis* (Abich)	Burikhel, Mohra
A 224	*Notothyris lenticularis* Waagen	Burikhel
A 225	*Notothyris minuta* Waagen	Khura, Mohra
A 229	*Uncinulus theobaldi* Waagen	Mohra, Amb, Wargal
A 231	*Camarophoria purdoni* Davidson	Amb, Burikhel, Mohra, Wargal
A 232	*Spirigerella derbyi* Waagen	Burikhel, Chhidra, Wargal, Jabbi, Amb, Khura
A 233	*Spirigerella acutiplicata* Waagen	Amb, Burikhel
A 234	*Spirigerella hybrida* Waagen	Burikhel
A 235	*Spirigerella grandis* Davidson	Amb, Burikhel, Dak Pass, Chhidra, Khura, Wargal
A 236	*Spirigerella minuta* Waagen	Burikhel, Wargal
A 237	*Athyris subexpansa* Waagen	Burikhel, Chhidra
A 238	*Athyris capillata* Waagen	Amb, Burikhel, Jabbi, Chhidra
A 239	*Eumetria grandicasta* Davidson	Mohra, Amb, Burikhel
A 240	*Eumetria indica* Waagen	Amb, Jabbi, Mohra
A 243	*Spiriferina ornata* Waagen	Amb, Mohra, Wargal
A 245	*Spiriferina musakheylensis* Davidson	Mohra, Burikhel, Chhidra, Khura, Wargal
A 249	*Martinia chidruensis* Waagen	Khura, Mohra, Wargal
A 250	*Martinia semiplana* Waagen	Amb, Khura, Mohra, Wargal
A 252	*Enteletes* sp.	Wargal
A 257	*Productus abichi* Waagen	Warcha, Jabbi
A 258	*Productus gratiosus* Waagen	Mohra, Wargal
A 259	*Productus indicus* Waagen	Burikhel, Chhidra, Warcha
None	*Dielasma* sp.	Khewra

Appendix J: PLANKTON FROM THE PERSIAN GULF

by Thomas E. Bowman, P. A. Chappuis and H. Herbst

MRS. OSCAR T. OWRE, Marine Laboratory, University of Miami, furnished the Expedition with collecting equipment with the request that plankton be collected in the Persian Gulf.

On February 23, 1955, with the assistance of Mr. Max W. Thornburg, I made a plankton tow between Umm as-Sabaan island and the northwest coast of Bahrain.

Dr. Thomas E. Bowman, Associate Curator, Division of Marine Invertebrates, U. S. National Museum, examined the plankton samples and reported as follows:

> The pelagic copepods consist of two species, *Oithona brevicornis* Giesbrecht and *Paracalanus crassirostris* Dahl, both widely distributed species. I know of only one paper on copepods from this area (Pesta, Otto, 1912: "Copepoden aus dem Golf von Persien," Wissenschaftliche Ergebnisse der Expedition nach Mesopotamien, Crustaceen: I, pp. 39–62, 26 figs.); neither of the species mentioned above is included. Both, however, have been reported from a number of localities in the Indian Ocean, so their occurrence in the Gulf is not surprising. The remainder of the copepods consisted of juvenile stages of a very few species of calanoids, including some specimens of *Arcartia,* and a large number of *harpacticoids,* a group of benthic copepods. Their presence in the sample suggests that the tow was made in rather shallow water.
>
> I have been able to identify one of the species as *Eudactylopus latipes* T. Scott *f. andrewi* Sewell. The sample contained one male and one female of this harpacticoid.

In accordance with Dr. Bowman's suggestion, a plankton sample was shipped to Dr. P. A. Chappuis, Laboratoire de Zoologie de la Faculté des Sciences Alliés, Saint Michel, Toulouse, who wrote that the harpacticoids belonged to the following 4 species:

Enterpina acutifrons (Dana)
Laophonte cornuta Phillipi (2 males only)
Amphiascus hirtus Gurney
Ectinoroma melaniceps Boeck

The Cyclopoida, which were determined by Dr. H. Herbst at Krefeld, belonged to *Oithona nana* (Giesbrecht) and *Oithona attenuata.*

The Centropagids were all juvenile and, as such, impossible to identify.

APPENDIX K: PLANTS COLLECTED IN THE PERSIAN GULF

BY RONALD CODRAI

THE FOLLOWING plants were collected during April, 1955 on the Qatar Peninsula and along the Trucial Oman Coast. Dr. Henry Field, who collected a few herbarium specimens[1] in these two areas during the Peabody Museum-Harvard Expedition, 1950, invited me to send these to him as a complement to his series.

Through the courtesy of Sir Edward Salisbury, Director of the Royal Botanic Gardens at Kew, Dr. R. A. Blakelock sent the following list of identifications on January 19, 1956:

A. QATAR PENINSULA

No.	*Herbarium Specimen*
1.	*Savignya parviflora* (Del.) Willd.
5.	*Helianthemum lippii* (L.) Dum.-Cours.
6.	*Reseda muricata* Presl.
7.	*Zygophyllum coccineum* L.
9.	*Zygophyllum simplex* L.
16.	*Fagonia glutinosa* Del.
19.	*Cassia aschrek* Forsk.
24.	*Glossonema varians* (Stocks) Benth. (*G. edule* N. E. Br.)
27.	*Herniaria hemistemon* J. Gay

B. TRUCIAL OMAN[2]

No.	*Arabic Name*	*Herbarium Specimen*
2.	Al Gharaira	*Eremobium aegyptiacum* (Spreng.) Hochr.
3.	Alqa	*Dipterygium glaucum* Decne.
4.	Tarfa	*Tamarix* sp. (no flowers)
8.	....	*Zygophyllum coccineum* L. Harm.
10.	Zaharra	*Tribulus* sp. (no flowers or fruit)
11.	Zahra	*Tribulus* sp. (no flowers or fruit)
12.	Zaharra (Zaraiga)	*Tribulus* sp. (no flowers or fruit)
13.	Zaharra	*Tribulus* near *pterocarpus* Ehrenb.
14.	Shitja	*Fagonia glutinosa* Del.
17.	Jarna	*Monsonia nivea* J. Gay
18.	Jarnu	*Monsonia nivea* J. Gay
20.	Al Kharaira (Al Dhafar)	*Tephrosia* sp. (material inadequate)
21.	Sa'adana	*Neurada procumbens* L.
22.	Al Riqm	*Gisekia pharnacioides* L.
23.	Afara	*Gisekia pharnacioides* L.
25.	Al Ashqara	*Calotropis procera* (L.) Ait. f.
26.	Harmala	*Rhazya stricta* Decne.
28.	Al Hatha	*Cornulaca aucheri* Moq.
29.	Silai	*Cornulaca* sp. ? (material inadequate)
30.	Al Harradan	*Suaeda* ? (material inadequate)
31.	Sanad	*Suaeda* ? (material inadequate)
32.	Shinan	*Suaeda* ? (material inadequate)
33.	Al Arad	*Salsola* sp. (material inadequate)
34.	Arta (Abla)	*Calligonum comosum* L'Hérit.

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[1] *See* Field, 1956d, pp. 71–76. The herbarium specimens collected in Baluchistan and Bahawalpur will be identified at the Gray Herbarium, Harvard University.

[2] From the *Liwa*, Ramlat at-Hamra and Saruq areas. No. 15 could not be identified.

APPENDIX L: USEFUL PLANTS AND DRUGS COLLECTED BY THE EXPEDITION

THE FOLLOWING were obtained from Nur Muhammad, son of a local herb doctor, in the environs of Karachi. Nos. 15–18 were collected during our trip to Tatta (Appendix B).

No.	*Urdu*	*Preparation and Use*
1	Somp	Cook and chew for stomach-ache.
2	Gipata	Heat leaf in water almost to boiling point. Add cooking oil. Use leaf as poultice for boils.
3	Akelkura	Place seed pod as poultice for inflamed gums. Within 30 minutes excessive salivation relieves pain.
4	Arandi Datura	Cook seeds as laxative for children. Similar plant is poisonous. *See* No. 7.
5	Kangroo	Boil dry leaves. Drink three times daily for fevers except malaria.
6	Mundi	Prepare syrup of leaves and berries for childbirth pains.
7	Datura	Poisonous. *See* No. 4. Cook seeds in mud vessel (*chatti*). Filter liquor. Repour into vessel and add whiskey. Ferment for 2 days. Very powerful tonic for debility.
8	Nirri	Cook with Nos. 5 and 9 to relieve "black fever."
9	Megri	Cook with Nos. 5 and 8 to relieve "black fever."
10	Metti	Used as firewood for adding hot flame for cooking flat unleavened cakes (*chupattis*).
11	Sira	Boil with cinnamon. Drink spoonful every 5 minutes either to clear phlegm in throat or to relieve headache.
12	Pudinah	Pound leaf and stem together with *nim* leaves. Poultice festering sore.
13	Sikri	Adult butterfly places it beside chrysalis as food.
14	Pepri	Increases milk of Zebu cows but gives milk strong smell and taste.
15–16	....	From near Indus River ferry, southeast of Tatta in Sind.
17	Gehaun	Wheat from near Indus River.
18	....	From near Indus River ferry, southeast of Tatta in Sind.
19	Bud Kutaira	Place round vessel (*chatti*) in basin of cold water. Insert small jar with seeds boiled in hot oil. Inhale steam as from vapor kettle. Small, white, needlelike worms fall out of gums after 5 minutes.

APPENDIX M: GLOSSARY OF AGRICULTURAL IMPLEMENTS USED IN MAKRAN[1]

Baluchi	*Description*
Arin	Plank harrow with an iron edge. See *ken.*
Arra (Panjgur)	A sickle. See *das.*
Bard	Triangular iron spade.
Dahmard	Wooden wedge at the end of the plow shaft.
Das	A sickle. See *arra.*
Doshaha	A two-pronged wooden fork used for winnowing, etc. See *sanga.*
Gwalag	Goat hair sack for carrying fodder and grain.
Hanshon (Dasht)	Wooden spade used for winnowing. See *kasag.*
Hosham	The two vertical bars passing through the yoke.
Humb	Earthen pot used for preserving dates.
Jugh	A yoke.
Kach	Dwarf palm sack used for collection and carriage of manure.
Kail (Kolwa)	Wooden measure for grain.
Kalamgor (Kech)	Implement with iron prongs for making small embankments. See *koraz.*
Kamer	Plow shoe.
Kapat	Dwarf palm basket for gathering dates.
Kapatag	Dwarf palm sowing drill.
Kasag	A wooden spade for winnowing. See *hanshon.*
Ken (Kolwa)	A plank harrow with iron edge. See *arin.*
Kodal	A mattock.
Koraz (Panjgur)	Iron pronged implement for making embankments. See *kalamgor.*
Lachuk	Ornamental dwarf palm hand basket with cover for ripe dates.
Langar	Plow.
Malag (Kolwa)	Wooden log used as clod crusher. See *marz.*
Mard (Kulanch)	Plow handle. See *musht.*
Marz	A wooden log used as clod crusher. See *malag.*
Metin (Kech)	Iron bar with broad point.
Mubang (Panjgur)	Iron bar with broad point.
Musht	Plow handle. See *mard.*
Panchan (Dasht)	Five-pronged wooden winnowing fork, sometimes called *panch-shaha.*
Parbun (Panjgur)	Climbing belt for gathering dates. See *tor.*
Pat (Kech)	Large dwarf palm sack for storing grain.
Pat	Small dwarf palm bag for storing *laghati* dates.
Rambi	A weeding spud.
Sabt or Sapt	Dwarf palm basket used for cleaning *karezes* and other agricultural purposes.
Sanga (Dasht and Kulanch)	Two-pronged wooden fork. See *doshaha.*
Shat	Ox goad.
Sher	Rope fastening the plow shaft to yoke.
Shitting	Plow shaft.
Sund	Dwarf palm bag used for enclosing date bunches on tree.
Taffar	Hatchet.
Tor	Climbing belt for gathering dates. See *parbun.*

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[1] Names of implements, which are not common to all parts of Makran, are supplemented with the name of the locality, in parentheses, in which they are particularly used.

APPENDIX N: DATE TREES IN MAKRAN

No.	*Name*	*Notes*
1	Ap-e-dandan	Fruit yellow, 1¾ inches long, circumference 2¾ inches; thickest toward head. Stone thicker than that of other species. Considered best of all Kech dates when fresh. Seldom dried.
2	Begam jangi	Fruit (1½ x 2¾) similar to No. 1. Best species for drying. Does not deteriorate with preserving and retains its original taste.
3	Haleni	Fruit (1¼ x 3½) similar to No. 1, but shorter, rounder, more stumpy and of equal thickness at both ends. Stone very small and round; a late ripener, often called *pash-pag* ("latest of all").
4	Chapshuk	Fruit (1.0 x 2¾) yellow, easily damaged by rain.
5	Nazani- (Nazane-) tabaqi	Very rare, although an old species. Fruit is yellow, thicker and shorter than No. 1. Eaten fresh. About 40 trees in Kech, and 5 in Turbat.
6	Kuzanibad	Scarce. Fruit yellow and similar to No. 1, but the skin is thinner.
7	Muzati (Muzawati or Muzapati)	Fruit (1¾ x 2¾) blood colored. Largely used for preserving in Panjgur. In Kech it is boiled and dried.
8	Zard-e-kallagi	Scarce. Similar to No. 2, but fruit is larger. More easily injured by rain than any other date.
9	Arrisht (Arrarisht)	Fruit similar in color to No. 8, but somewhat larger. Stone is very long and thin.
10	Sabzo	Fruit (1¾ x 3¾) yellowish-green, whence its name. This is the *Ap-e-dandan* (*see* No. 1) of Panjgur, eaten fresh. In Kech there are only two or three trees.
11	Barr-i-shakari	The name is modern. Color and fruit similar to No. 29. A single tree in Kaush-Kalat (Kush-Kalat).
12	Dandari	Fruit (2½ x 2¾) yellow and similar to No. 1 in shape, but longer and thinner; stone very thin. Eaten fresh, also skinned and preserved; brings a good price, but is generally mixed with others before being sold.
13	Rabai	Can be distinguished from No. 12 only by experts. Juice famous. Numerous in Panjgur.
14	Dandari-gon	So-called because similar to No. 12. Rather scarce.
15	Gurbago	Somewhat scarce. Easily injured by rain. Color yellow. Very tasteful in winter. Size similar to No. 63.
16	Shinghish-kand	Similar to No. 63 in color, shape and size, but is better eating. Scarce.
17	Haragi	Resembles No. 63. Only numerous in Pidarak, scarce elsewhere.
18	Shehri	Resembles No. 63, but yellowish-white. Numerous only in Panjgur.
19	Siah-dap	Yellow. Similar to No. 18. So-called because its mouth is black. Scarce.
20	Miri-e-zard	Similar to No. 41, but is better eating and brings a higher price. Scarce.
21	Panidi (Panido)	Similar to No. 41, but is better eating and brings a higher price. Scarce.
22	Miri-e-surkh	Red, otherwise similar to No. 20. Scarce.
23	Jowana-bu-shams	Similar in color and size to No. 20. Scarce.
24	Goari	Yellow. Resembles No. 8. Scarce, and inferior in taste.
25	Pono	Yellow. Size similar to No. 24. Scarce.
26	Bindak	Yellow. Size similar to No. 24. Scarce.
27	Pash-pag	Yellow. Similar in size to No. 55. The latest of all dates. Scarce.
28	Irdiki	Yellow. Similar in size to No. 55. Scarce.
29	Shakari	Size rather smaller than No. 82, but somewhat longer. When ripening, it is red; when ripe, dark. Scarce.
30	Kalut	Yellow. Similar in size to No. 82. Good eating. More extensively grown in Panjgur than in Kech.

31	Reko	Yellow. Similar in size to No. 2. Good eating. Brings good price. Scarce.
32	Napagi	Red. Similar in size to No. 2. Scarce.
33	Khalas	A *kuroch* tree. *See* No. 86.
34	Shepago	Yellow. About the thickness of the little finger and 1½ inches in length. So-called because it is as thin as an antimony stick (*shepag*). Scarce.
35	Ichko (Gichko)	Yellow. A very small, round, thick date. Scarce.
36	Fard	Very rare. Color red. Size and taste similar to No. 7. Believed to have been introduced from Muscat between 1870–1900. There is another quality known as *Fard-e-zard.*
37	Zorabad	Similar to No. 42. Scarce.
38	Siah Ganok	Fruit (2½ x 4½) yellow. One tree in Kaush-Kalat.
39	Sohren (Surain) ap-e-dandan	A variety of No. 1, but fruit smaller and thinner, and not so tasteful. Dark-reddish brown.
40	Haleni-gon	Fruit (1¼ x 3½ at lowest point). Similar to No. 3, as its name signifies.
41	Dishtari	Fruit (1¼ x 2½) yellow. Not quite so long or thick as No. 1, but the stone is thicker. It was once very famous. A proverb runs, *Dishtari dila dari mat wart chuk chari* ("Dishtari is so enticing that a mother eats it while she lets her son look on.") The name denotes the bride's tree, as it was the only tree presented as dower in former times.
42	Rogini	Fruit (1¼ x 2¾) yellow. Somewhat smaller than No. 41, but thicker in proportion. Rare in Panjgur.
43	Rogini Buledai	Fruit (1.0 x 2½), smaller than No. 42, but darker in color. Found in Kech and Panjgur in smaller numbers than in Buleda.
44	Shuksh	Rare. Fruit round and thicker and longer than No. 42. Reddish.
45	Nazan dazi	Similar to No. 42. Very scarce. Only one or two trees in Turbat.
46	Jowana Jamaki	Yellow. Similar in thickness to No. 42, but a little longer. Only two trees in Turbat, but numerous in Jamak and Gwarkop.
47	Ap-rogin	Yellow. Similar to No. 42, but a little thicker and longer. Scarce.
48	Chapshuk kulonti	Very liable to decay. Scarce.
49	Jauzo	Resembles No. 42, but not such good eating. Scarce.
50	Masudi	Yellow. Similar in size to No. 42. Scarce.
51	Rago	Yellow. Similar in size to No. 42. Scarce.
52	Anguro	Yellow. Similar in size to No. 35. Tastes like No. 42. Scarce.
53	Nasua (Nasuha)	Red. Similar in size to No. 42. Scarce.
54	Wash kung	*Zard* (yellow) resembles No. 41. *Sohr* (red) and resembles No. 12. Both scarce.
55	Gonzali	Fruit (1¼ x 3.0) dark, round and about the size of a small marble. Very numerous.
56	Bor	Color chestnut. Similar in size to No. 55. Scarce.
57	Kaleri	Similar in shape, but smaller than No. 55. When ripening, it is crimson; when ripe, dark red. A few trees in each village.
58	Umbi	Red. Similar in size to No. 57. Scarce.
59	Kungo (Kungun)	When ripening, it is crimson; when ripe, black. Rather smaller than No. 12, with a thinner stone. Not easily injured by rain. Tasteful in winter and better than No. 55. A few trees in each village.
60	Jalagi mulki	Yellow. Fruit similar to No. 59 in size.
61	Jalagi kohi	An inferior date. During ripening yellow; when ripe, very dark. Similar in size to No. 59. Scarce.
62	Jalagi rustai	Yellow. Similar in size to No. 59. Not easily injured by rain. Scarce.
63	Husseni	Equal in length to No. 59, but thinner. Yellow. Little injured by rain. Poor eating. Straight trunk is used for beams and rafters. Scarce.
64	Charpan	Red. Resembles No. 55, but has better taste. Scarce.
65	Makili	Resembles No. 6. Very scarce.
66	Jowana (Siahkarz)	*Gonzali* (No. 55) has no saccharine juice, *Jowana* a great deal.

67	Sadrami	Yellow. Similar in size to No. 66. Scarce.
68	Shorai	Brown. Similar in size to No. 66. Scarce.
69	Kaleruk	Shape and size similar to No. 55. When ripening, it is red; when ripe, dark. Scarce.
70	Kaler	Shape and size similar to No. 55. When ripening, it is red; when ripe, dark. Scarce.
71	Kikri	Red. Similar in size to No. 69. Scarce.
72	Boal	Yellow. Similar in size to No. 55. Scarce.
73	Karpaso	Yellow. Similar in size to No. 55. Tasteless. Scarce.
74	Mahtap taza	Name modern. Yellow. Round like No. 55. A single tree in Kaush-Kalat.
75	Konaro	Yellow. Similar in size to No. 55. Scarce.
76	Pesh-na	Fruit (2½ x 1¼) yellow, but red when ripening. So-called because it ripens before all other dates. Numerous.
77	Wash-na	Color and size similar to No. 76. Scarce.
78	Pull	Similar to No. 76; ripens as early. Scarce.
79	Challo	Yellow. Similar in size to No. 76. Scarce.
80	Dar-na	Very like No. 76. Will not break when it falls to the ground; hence called *dar-na* ("strong as wood"). Scarce.
81	Posto	Yellow. Similar in size to No. 76. Poor eating. Scarce.
82	Gogna	Fruit (1½ x 3¾). Very numerous. The largest and thickest of all dates, with the exception of No. 83. Its name denotes it size: "as big as a cow." One date is said to be more than a mouthful.
83	Kala dizzaki	Red. Larger than No. 82, but not good eating.
84	Ari	Yellow. Similar in size to No. 82. Scarce.
85	Sunt gurag	In size and shape similar to No. 8. Crimson when ripening; brown when ripe. Named after its similarity to a crow's bill. Scarce.
86	Kuroch	A tree of natural growth: *zard* (yellow), *sohr* (red), and *shunsh* (red and yellow). The first two resemble No. 76 in size, the other (*see* No. 101) is like a small pellet. *Shunsh* is not very common.
87	Barni	Color chestnut and size similar to No. 12. Fruit is liable to decay. Very juicy. Scarce.
88	Baz-khuda bun	Yellow. Similar in size to No. 18. Scarce.
89	Sohr-dana	Red. Similar in size to No. 2. Found in Sami, but not in Turbat.
90	Musali	Red. Similar in size to No. 7. Never damaged by rain. Only one very old tree is to be found in Shahrak. Possibly its origin was Musal in Syria.
91	Sibil	Yellow. Similar in size to No. 34. Only one tree in Shahrak.
92	Parramo	Red. Similar in size to No. 35. Scarce.
93	Kalag dirr	A *kuroch* tree, found only in Kulanch.
94	Kulonti	Yellow. One tree here and there in Kaush-Kalat.
95	Wakhshi	Name new. Yellow. Few trees in Kaush-Kalat.
96	Wash kulont	Yellowish-white. Similar in size to No. 23. Better eating when ripening than when ripe. Scarce.
97	Gund gurbag	Yellow. Similar in size to No. 8. Scarce.
98	Rogini sakano	Yellow. Similar in size to No. 24. Poor eating. Scarce.
99	Puppo	Yellow. Similar in size to No. 98. The Panjgur date palm is larger and gives more fruit. Scarce.
100	Asami	Yellow. Similar in size to No. 23. Only three trees in Jusak.
101	Shunsh (Junj)	One kind is yellow, the other is red. A very small date. Compared by the Baluchis to a slave who eats and does not work. Is little more than skin and stone and is generally given to cattle. "Eat one seer of *Shunsh* and there will be one and a half seers of stones" is the saying.
102	Pachki	Color dark when ripe. Similar in size to No. 55.
103	Zard-e-rais	Yellow. Similar in size to No. 76. Peculiar to Buleda, although found in Kech and Panjgur. Few trees.

DATES PECULIAR TO PANJGUR

104	Kahruba	Length (1.0 x 2½). Yellow. Similar in size to No. 2. Sap is put into jars (*humbs*) for preserving *Muzati* (No. 7) dates. Also eaten fresh in large quantities and preserved as *danagi* and largely consumed in Las Bela and Jhalawan.
105–107	Sohr (Siah or Zard Kuroch)	Red, black and yellow in color. Although *Kuroch,* they are famous for the quality of their fruit. *Sohr Kuroch* (1½ x 2¾). *Zard Kuroch* (1¼ x 2¾). The size and shape of *Siah Kuroch* resemble that of *Zard Kuroch.* All these *Kuroch* are largely preserved either by themselves or mixed with *Kahruba* (No. 103) and are largely passed off on the people of Las Bela as *Kahruba* and sold at their prices.
108	Lango	Similar in size to No. 106 and no better in quality. Preserved and mixed with *Kuroch* and also with *Kahruba* (No. 103). Somewhat scarce.
109	Hushkich	Peculiar to Dizak. Brought to Panjgur to be preserved.

Notes: The most numerous trees in Panjgur in order of importance are: (*a*) Kahruba, Muzati, Sabzo, Dandari, Rabai and Kalut—all "pedigree" trees; and (*b*) Zard and Sohr Kuroch.

The following are "pedigree" dates: Nos. 1–5, 7–10, 12, 13, 15–17, 20, 21, 23, 24, 27, 31, 41, 42, 53, 55, 57, 59, 61–63, 65–67, 69, 70, 72, 76, 77, 81–83, 85, 87 and 104.

Appendix O: ANIMAL BRANDS IN CHOLISTAN

IN ORDER to supplement the list of camel brands and graffiti from Southwestern Asia (Field, 1952), I recorded some camel brands (fig. 44) during our archæological reconnaissance in the Cholistan area of Bahawalpur State.

Mr. Khurshid Ahmed, Cholistan Development Officer, very kindly forwarded the following list of 51 animal brands. Since each tribal group was written in Urdu, I requested Mrs. Iffat Ahnas, a Pakistani schoolteacher visiting Florida, to translate this column.

LIST OF TRIBAL GROUPS

No.	*Group*
1.	Mahr
2.	Slae
3.	Machhie
4.	Bohar
5.	Pezadey
6.	Joia
7.	Kamrani Joia
8.	Baluch of Mir Garh
9.	Daha
10.	Bahey
11.	Dhadi
12.	Daiut
13.	Randheray
14.	Daha of Rukanpur
15.	Parhiar of Rukanpur
16.	Color of Rukanpur
17.	Sayed of Pathani
18.	Daiut of Pathani
19.	Lahanga of Rukanpur
20.	Naich of Rukanpur
21.	Chanter of Rukanpur
22.	Anean of Rukanpur
23.	Bohar of Rukanpur
24.	Bhey of Pathani
25.	Bhey of Rukanpur
26.	Baluch of Rukanpur
27.	Meher of Pakhot
28.	Sheikhzadé of Salamlar
29.	Katwal of Salamlar
30.	Katwal of Pakhot
31.	Tanwari of Rarullar
32.	Parhar of Wakhohar
33.	Sheikh Din Garh
34.	Bohar of Baho
35.	Lord of Din Garh
36.	Majawar of Channan Pir
37.	Hajam of Rukanpur
38.	Pathan of Rukanpur
39.	Sarkari
40.	Bahar of Khangarh
41.	Meher of Derawar
42.	Makol of Din Garh
43.	Kalwar of Chahkora
44.	Mache of Rukanpur
45.	Dahakame of Rukanpur
46.	Kori of Rukanpur
47.	Daha of Kandani
48.	Bhey of Janorali
49.	Bhey of Malkani
50.	Belahem
51.	Juni

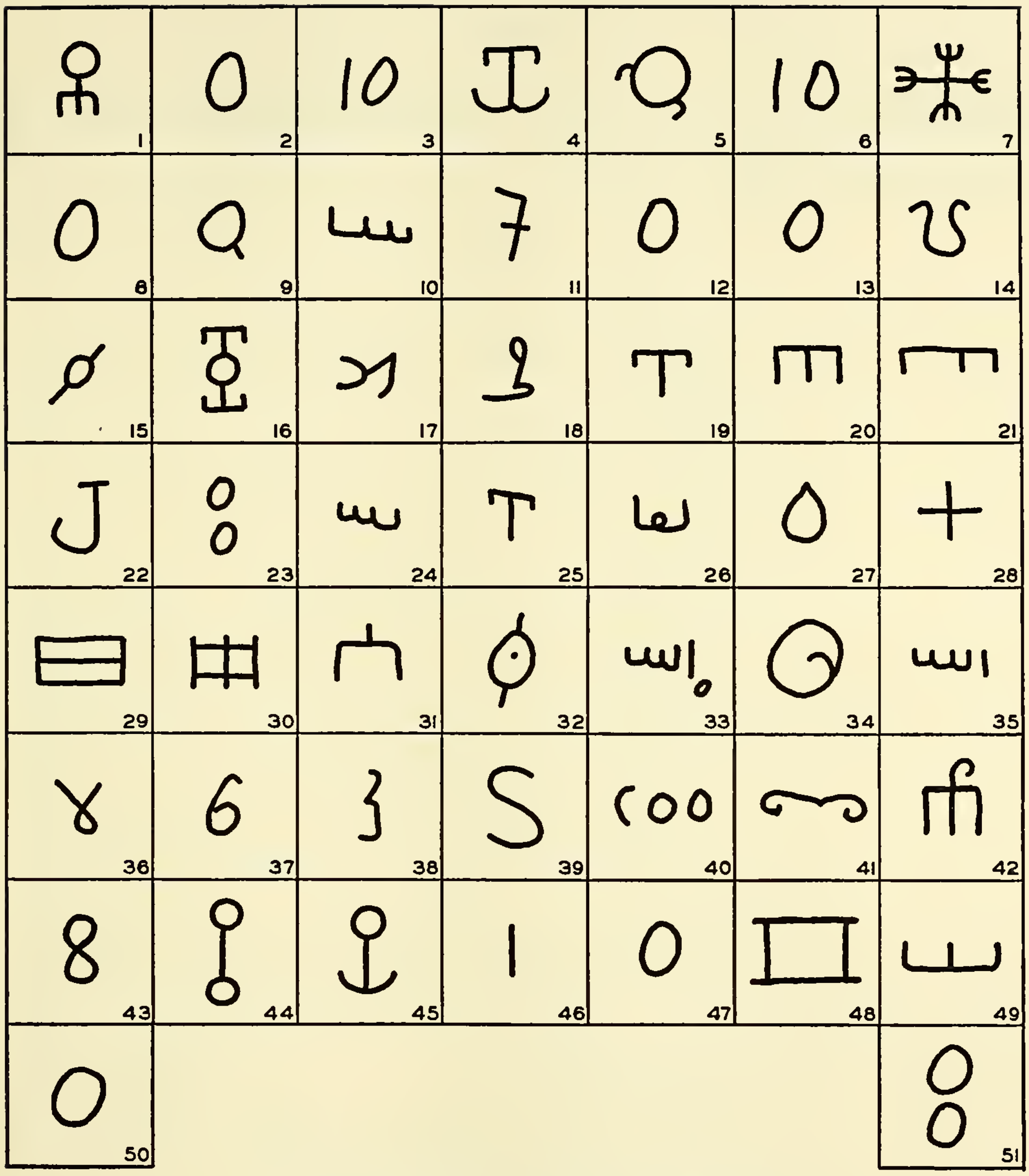

Fig. 44. Camel brands from Cholistan, Bahawalpur.

APPENDIX P: ETHNOLOGICAL COLLECTION

THE FOLLOWING specimens, now in the Peabody Museum, were obtained in Makran and Kalat. The localities were: Nos. 1, 11–15, 21–23, Kalat; Nos. 2–10, 16, Mastung; No. 17, Big Kapoto, 10 miles south of Kalat; Nos. 18–19, Little Kapoto; and No. 20, Turbat. The names are in Baluchi.

1. Large gray coat (*zurh*).
2. Basket for winnowing (*chach*).
3. Plow (*langar*).
4. Metal plow tip (*kamer*) usually drawn by bulls (sing. *kharass*), sometimes by camels (sing. *uch*).
5. Multicolored bag (*istarajal* or *pukhchuru*) for holding Koran.
6. Blue necklace (*khandi*) for bulls and horses.
7. Large camel bell (*chiring*).
8. Six small sheep bells on metal rack, also called *chiring*.
9. Three bells (*ghungru*), with split in base, for bulls.
10. Ornamented axehead (*tabarzin* or *chatri*).
11. Two silver anklets (sing. and pl. *padink*), figure 66.
12. Silver necklace (*chakmali*) with hanging circular ornaments (fig. 63).
13. Two pair of silver wristlets (*chakmi*), each with 12 ornaments all strung together.
14. Headband (*palti*) with red cloth and ornamented with silver (fig. 65).
15. Two pairs of hair ornaments (*chotil*) for braids with silver tassels (fig. 62).
16. Folding bird cage (*loat*) for quail (*butair* or *baru*).
17. Large decorated bag (*tureh*).
18. Small decorated bag also called *tureh*.
19. Small water bag (*khoa*) of goatskin for curds (*dai*).
20. Rug (*kund*) of goat and sheep wool; if of cotton, called *duree*.
21. Silver breastplate (*tawiz*).
22. Cradle (*jhulunt*).
23. Small, round pillow (*senu*) with hollow center filled with cotton seeds (*pambar*); this is used for first 3 months. Forehead (*peshani*) is bound with cloth (*daspak*) for first month.
24. Wooden wheel from oxcart. This was purchased near Mohenjo-daro on account of its similarity to clay toy carts excavated at the classical site of the Indus Valley civilization.
25. Modern pottery from Baluchistan and Bahawalpur for comparison with early types.

APPENDIX Q: MANUSCRIPTS MICROFILMED

THE FOLLOWING 33 titles (3,306 pages) have been placed on microfilm in the American Documentation Institute, % Photoduplication Service, Library of Congress, where copies may be purchased. This supplements the list of 21 titles (3,451 pages) published *in* Field, "The Anthropology of Iraq," Part II, no. 2—Kurdistan and no. 3—Conclusions, PMP, vol. 46, nos. 2 and 3, pp. 1–174, 1952; and 26 titles (3,028 pages) *in* "An Anthropological Reconnaissance in the Near East, 1950," PMP, vol. 48, no. 2, pp. 82–85, 1956.

No.	*Subject*	*Pages*	*Microfilm*
1	A Regional Survey of East Pakistan *by Shamshur Rahman*	1–270	4762
2	Urban Geography of Sukkur and Neighborhood *by Abbas Ghulam*	1–244	4763
3	Lahore: a Study in Urban Geography *by Naseer Ahmed Jan*	1–161	4764
4	Miscellanea Asiatica Occidentalis: XIII	1– 89	4876
	(a) Ancient Customs concerning Hair and Nails *by Henry Field*	1	
	(b) Protective Magic of the Person and Property *by Henry Field*	65	
5	Miscellanea Asiatica Occidentalis: XIV	1–146	4809
	(a) Osete Language and Folklore *by V. I. Abaev*	4	
	(b) The Lion and the Tiger in India and Persia *by Ronald Sinclair*	104	
	(c) Stone Age Highways in Malta *by Ronald Sinclair*	109	
	(d) Tattooing in Southwestern Asia *by Henry Field and Winifred Smeaton*	112	
	(e) Location of Archæological Sites in Northern Saudi Arabia *by Don Holm*	129	
	(f) Photographs from Iraq, Jordan, Palestine *by Henry Field*	130	
	(g) Photographs of Central Sinai during University of California-African Expedition, 1947–1948 by *William B. Terry*	144	
	(h) Rock-drawings at Bir Abraq, *by Harry Hoogstraal*	146	
6	Urban Geography of Multan and its Neighborhood, West Pakistan *by Mumtaz Husain*	1–211	4816
7	A Geographical Survey of Locust-affected Areas in West Pakistan *by Ashar Saeed Khan*	1–179	4815
8	Miscellanea Asiatica Occidentalis: XV *by Henry Field*	1– 79	4829
	(a) Contributions to the Anthropology of the Caucasus		
	Azerbaidzhan 6		
	Nakhitchevan 26		
	Armenia 28		
	Georgia 39		
	Abkhazia 45		
	(b) Bibliography on Archæology and Physical Anthropology		
	Israel 47		
	Syria 60		
	Turkey 69		
	Iraq 77		
	Iran 78		
	Afghanistan 79		
9	A Reconnaissance along the Haqra River *by Sir Aurel Stein*	1–194	4861
10	Miscellanea Asiatica Occidentalis: XVI *by Henry Field*	1–139	4876
	Anthropometric Data on Baluchis (34 from Turbat; 103 from Panjgur)		
11	Miscellanea Asiatica Occidentalis: XVII *by Henry Field*	1–140	4877
	Anthropometric Data on 138 Brahuis from Baluchistan, West Pakistan		
12	Miscellanea Asiatica Occidentalis: XVIII	1–115	5200
	(a) Flint Implements from Ar-Rawafi, northeastern Sinai *by Henry Field*	4	

No.	*Subject*	*Pages*	*Microfilm*
	(b) Flint Implements from the Wadi Ba'aba, southwestern Sinai *by Henry Field*	8	
	(c) Notes on Air Traverse from Cairo–Dhahran, February 24, 1955 *by Henry* Field	15	
	(d) Notes on Gardens in Egypt *by Caroline Lansing*	21	
	(e) Conditions of soil Formations and Types of Soil of Northern Iran *by M. P. Petrov*	28	
	(f) Pakistan fights against Locusts *by Ashar Saeed Khan*	44	
	(g) Bahawalpur, 1948–54 *by the Directorate of Information and Public Relations,* Bahawalpur Government	53	
	(h) River Links of the Indus Valley Civilization *by Syed N. A. Z. Hussaini*	78	
	(i) Archæological Heritage of Pakistan *by the Pakistan Department of Archæology*	93	
	(j) Exploration in Bikanir, India *by A. Ghosh*	102	
13	Miscellanea Asiatica Occidentalis: XX	1– 99	5287
	(a) Climatological Maps of Iran *by Mohammed Hassan Ganji*	4	
	(b) Blood Groups of Assyrians in Iraq	31	
	(c) Makran Village List	38	
	(d) Traverse Reports from Pasni-Quetta, West Pakistan *by Henry Field*	53	
14	Miscellanea Asiatica Occidentalis: XXI	1– 93	5288
	(a) Equipment used during Archæological Survey of the North Arabian Desert *by Henry Field*	4	
	(b) Note on Stone Implement from Wadi Gaza, Palestine *by J. Gilbert Browne*	17	
	(c) Notes on the Sulubba and Sherarat *by Douglas Carruthers*	20	
	(d) Notes on Trucial Oman Coast and Das Island *by T. A. D. W. Hillyard*	21	
	(e) Locations along Tapline Saudi Arabia *by Don Holm*	23	
	(f) Quartzite Stone Implement from Saudi Arabia *by Don Holm*	24	
	(g) Sketch Map of the Hadhramaut *by A. R. M. Rickards*	25	
	(h) List of Theses on Geographical Topics in Faculty of Literature, University of Tehran *by Mohammed Hassan Ganji*	26	
	(i) Camel Brands near Muhaiwir, Iraq *by E. W. K. Andrau*	32	
	(j) Excavations at Basargechar, Armenia *by Armenian Academy of Sciences*	33	
	(k) Archæological Notes from Kharan, West Pakistan *from The Gazetteer of Baluchistan*	39	
	(l) Camel Brands from the Sahara *by Hilda Pilters*	50	
	(m) Notes on Wild Reindeer translated *by Ronald Sinclair*	57	
15	Anthropometric Data from Iraq: Subba males (Nos. 2888–2929) *by Henry Field*	1– 86	5446
16	Anthropometric Data from Iraq: Subba males (Nos. 2930–2969) *by Henry Field*	1– 82	5447
17	Anthropometric Data from Iraq: Subba males and females (Nos. 2970–3032) *by Henry Field and Winifred Smeaton Thomas*	1– 88	5448
18	Crania from Haditha, Iraq *by Henry Field*	1– 56	5322
19	Supplement to "Bibliography of Southwestern Asia: IV" *by Henry Field* These 738 references were omitted from Bibliography: IV because they were on subjects not included in B: I–III or on regions outside our prescribed area.	1– 59	5499
20	Anthropometric Data from Iraq: I. Jews (Nos. 3100–3173) *by Henry Field and Winifred Smeaton Thomas*	1– 88	5533
21	Anthropometric Data from Iraq: II. Jews (Nos. 3013–3099) *by Henry Field*	1– 75	5534
22	Miscellanea Asiatica Occidentalis: XXII *by Henry Field*	1– 48	5622

No.	Subject	Pages	Microfilm
	These 227 titles deal with three areas: *A*) Southwestern Asia (General); *B*) Persia (Iran); and *C*) India. The majority of *A* and *C* deal with Physical Anthropology		
23	Miscellanea Asiatica Occidentalis: XXIII, Iraqi Kurdistan	1– 94	5623
	(a) Notes on Tribes *by Henry Field*		
	(b) Oxford University Expedition to Kurdistan, 1956 *by Peter Galloway*		
24	Miscellanea Asiatica Occidentalis: XXIV	1– 55	5624
	(a) Stone Walls in Arabia *by Henry Field*	2	
	(b) Crania from Sinai *by Claudia Massari*	12	
	(c) Collecting Lepidoptera in Kurdistan, Iraq *by Henry Field*	15	
	(d) Medical Report of Oxford University Expedition to Socotra, 1956 *by N. W. M. Orr and R. L. Lister*	18	
	(e) Notes on Socotran Language *by Spencer Cooke*	35	
	(f) Witch Trials in Socotra *by I. E. Snell*	47	
	(g) Archæological Remains in Kharan, Baluchistan *by E. Vredenburg*	54	
25	Miscellanea Asiatica Occidentalis: XXV. Bibliography with 245 titles *by Henry Field*	1– 55	5625
26	Miscellanea Asiatica Occidentalis: XXVI. Bibliography with 250 titles *by Henry Field*	1– 51	5626
27	Miscellanea Asiatica Occidentalis: XXVII	1– 77	5627
	These notes and racial type photographs of Baluchis and Brahuis were taken at Mand, Turbat, Panjgur and Kalat by Julie Field during the Peabody Museum-Harvard Expedition to West Pakistan, 1955		
28	Miscellanea Asiatica Occidentalis: XXVIII	1– 51	5628
	Photographs by Julie Field from Bahrain, Saudi Arabia and West Pakistan		
29	Miscellanea Asiatica Occidentalis: XXIX	1– 61	5629
	Photographs by Julie Field from Sind and Bahawalpur, West Pakistan		
30	Anthropometric Data from Baluchistan: 39 Miscellaneous Males *by Henry Field*	1– 52	5630
31	Miscellanea Asiatica Occidentalis: XXX *by Henry Field*	1– 72	5641
32	Anthropometric Data from Iraq: 34 Assyrian Females *by Henry Field and Winifred Smeaton Thomas*	1– 48	5642
33	Anthropometric Data from Iraq: 42 Assyrian Females *by Henry Field and Winifred Smeaton Thomas*	1– 64	5643

REFERENCES

ABBREVIATIONS

AA	American Anthropologist, Menasha, Wisconsin
AAAS	American Association for the Advancement of Science, Washington
ABAW	Abhandlungen der Kgl. Bayerischen Akademie der Wissenschaften, Mathematische-Physikalische Klasse, Munich
AC	Archaeology, Cincinnati
ADIM	American Documentation Institute, % Photoduplication Service, Library of Congress, Washington, D. C.
AI	Ancient India, New Delhi
AJI	Agricultural Journal of India, Calcutta
AJPA	American Journal of Physical Anthropology, The Wistar Institute of Anatomy and Biology, Philadelphia
ALID	Agriculture and Livestock in India, Delhi
ALIPC	Art and Letters: India, Pakistan, Ceylon. London
AMN	American Museum Novitates, New York
AMNH	American Museum of Natural History, New York
ANLL	Archæological News Letter, University of London
AnMNH	Annals and Magazine of Natural History, London
AOG	Archiv für Orientforschung, Graz (formerly Berlin)
AOM	Australian Outlook, Melbourne
AOSS	American Oriental Society Series, New Haven, Connecticut
APK	Agriculture Pakistan, Karachi
AQR	Asiatic Quarterly Review, London
ARL	Asiatic Review, London
ASAZHP	Ankara Symposium on Arid Zone Hydrology, Proceedings. UNESCO, Paris, 1953
ASBP	Asiatic Society of Bengal, Proceedings, Calcutta
ASIAR	Archæological Survey of India, Annual Reports, Delhi
ASIM	Archæological Survey of India, Memoirs, Delhi
ASIR	Archæological Survey of India, Report, Delhi
ATMP	Annals of Tropical Medicine and Parasitology, Liverpool
BDA	Baluchistan Department of Agriculture, Karachi
BDG	Baluchistan District Gazetteer Series, Ajmer
BER	Bulletin of Entomological Research, London
BEZ	Berliner Entomologische Zeitschrift, Berlin
BGST	Bombay Geographical Society, Transactions
BML	Burlington Magazine, London
BSIR	Botanical Survey of India, Records, Calcutta
BSPGCL	Biological Society of Pakistan, Government College, Lahore
BSZF	Bulletin, Société Zoologique de France, Paris
CAASM	Connecticut Academy of Arts and Sciences, Memoirs, New Haven
CAL	Chemical Age, London
CCFS	Contributions of the Cushman Foundation, Sharon, Massachusetts
CENY	Collier's Encyclopaedia, New York
CSB	Current Science, Bangalore
DAB	Department of Agriculture, Bulletin, Bombay
DAM	Department of Agriculture, Memoirs, Bombay
DDFRI	Dehra Dun Forest Research Institute, Dehra Dun
EAL	The Eastern Anthropologist, Lucknow
EFJ	Empire Forestry Journal, London
EJN	The Explorers' Journal, New York
EL	Entomologist, London
FMNH	Field Museum of Natural History, now Chicago Natural History Museum
GJ	Geographical Journal, London
GM	Geographical Magazine, London
GML	Geological Magazine, London
GR	Geographical Review, New York
GSIM	Geological Survey of India, Memoirs, Calcutta. *See also GSIPI* and *GSIR*
GSIPI	Geological Survey of India, Palæontologia Indica, Calcutta. *See also GSIM* and *GSIR*
GSIR	Geological Survey of India, Records, Calcutta
GSP	Geological Survey of Pakistan, Quetta and Karachi

GSPR	Geological Survey of Pakistan, Records, Quetta and Karachi
GSQJ	Geological Society, Quarterly Journal, London
HMSB	Henry Martyn School of Islamic Studies, Bulletin, Aligarh, India
IA	Institute of Archaeology, University of London
IARIPB	Imperial (Indian) Agricultural Research Institute, Pusa Bulletin, Calcutta and New Delhi
IBSAI	Iraq; British School of Archæology in Iraq, London
ICAR	Imperial (Indian) Council of Agricultural Research, New Delhi
IEJT	Indian Economic Journal: University of Travancore, Trivandrum, India
IFND	Indian Farming, New Delhi
IFRES	Indian Forest Record, New Series; Entomological Section, Dehra Dun
IJAS	Indian Journal of Agricultural Science, New Delhi
IJE	Indian Journal of Entomology, New Delhi
IMC	Indian Minerals, Calcutta
IMCM	Indian Museum, Memoirs, Calcutta
IQND	India Quarterly; published by Indian Council of World Affairs, Kashi House, Connaught Place, New Delhi
IMD	India Meteorological Department, New Delhi
IMN	Indian Museum, Notes, Calcutta
IMR	Indian Museum, Records, Calcutta
IRM	International Review of Missions, London
IRW	Islamic Review, Woking, England
IWP	Illustrated Weekly of Pakistan, Karachi
JAAH	Journal of the Arnold Arboretum, Harvard University
JAE	Journal of Animal Ecology, Cambridge, England
JASB	Journal of the Asiatic Society of Bengal, Calcutta
JBaNHS	Journal of the Baluchistan Natural History Society, Quetta
JBNHS	Journal of the Bombay Natural History Society, Bombay
JCL	Journal of Conchology, London and Leeds
JESL	Journal of the Ethnological Society of London
JHL	Journal of Helminthology: School of Hygiene and Tropical Medicine, London
JIAI	Journal of the Indian Anthropological Institute, Calcutta
JIBS	Journal of the Indian Botanical Society, Madras
JNES	Journal of Near Eastern Studies, Chicago
JPT	Journal of Paleontology, Tulsa, Oklahoma
JRAI	Journal of the Royal Anthropological Institute of Great Britain and Ireland, London
JRAS	Journal of the Royal Asiatic Society, London
JRASB	Journal of the Royal Asiatic Society, Bombay Branch
JRCAS	Journal of the Royal Central Asian Society, London
JRE	Journal of the Royal Engineers, Chatham, England
JRGS	Journal of the Royal Geographic Society, London
JRIPCS	Journal of the Royal Indian, Pakistan and Ceylon Society, London
JRMS	Journal of the Royal Microscopical Society, London
JRSA	Journal of the Royal Society of Arts, London
JSIR	Journal of Scientific and Industrial Research, New Delhi
JWH	Journal of World History, United Nations, Paris
KB	Kew Bulletin, London
KCK	Karachi Commerce, Karachi
KGSB	Karachi Geographical Society, Bulletin, Karachi
LDM	London Daily Mail, London
LJN	Library Journal, New York
LSJB	Linnæan Society, Journal of Botany, London
MEJ	Middle East Journal, Washington, D. C.
MGIT	Mining, Geological and Metallurgical Institute of India, Transactions, Calcutta
MII	Man in India, Ranchi, South Bihar Province
MJP	Museums Journal; Organ of the Museums Association of Pakistan, Peshawar, West Pakistan
MPST	Medical and Physical Society, Transactions, Bombay
NISIB	National Institute of Sciences of India, Bulletin, New Delhi
NJM	Neues Jahrbuch für Mineralogie, Stuttgart (formerly *NJMGP*, Abt. A.: Mineralogie, Gesteinskunde)

NJMGP	Neues Jahrbuch für Mineralogie, Geologie und Paläontologie, Stuttgart
NWRM	North-West Railway Magazine, Lahore, West Pakistan
OMB	Ornithologische Monatsberichte, Berlin
PAPS	Proceedings of the American Philosophical Society, Philadelphia
PGR	Pakistan Geographical Review, Lahore, West Pakistan
PIAS	Proceedings of the Indian Academy of Science, Bangalore
PISC–XX	Proceedings of the Twentieth Indian Science Congress, Patna, 1933
PISC–XXII	Proceedings of the Twenty-second Indian Science Congress, Calcutta, 1935
PISC–XXIII	Proceedings of the Twenty-third Indian Science Congress, Indore, 1936
PISC–XXIV	Proceedings of the Twenty-fourth Indian Science Congress, Hyderabad, 1937
PISC–XXV	Proceedings of the Twenty-fifth Indian Science Congress, Calcutta, 1938
PISC–XXVI	Proceedings of the Twenty-sixth Indian Science Congress, Lahore, 1939
PISC–XXVII	Proceedings of the Twenty-seventh Indian Science Congress, Madras, 1940
PISC–XXVIII	Proceedings of the Twenty-eighth Indian Science Congress, Benares, 1941
PISC–XXIX	Proceedings of the Twenty-ninth Indian Science Congress, Baroda, 1942
PISC–XXXI	Proceedings of the Thirty-first Indian Science Congress, Delhi, 1944
PISC–XXXIII	Proceedings of the Thirty-third Indian Science Congress, Bangalore, 1946
PISC–XXXIV	Proceedings of the Thirty-fourth Indian Science Congress, Calcutta, 1947
PJF	Pakistan Journal of Forestry, Murree
PJH	Pakistan Journal of Health, Lahore
PJS	Pakistan Journal of Science, Lahore
PLPS	Proceedings of the Lahore Philosophical Society, Lahore, West Pakistan
PMP	Peabody Museum Papers, Harvard University
PNIS	Proceedings of the National Institute of Science of India, Calcutta
PPEC	Proceedings of the Punjab Engineers Congress, 1932
PQK	Pakistan Quarterly, Karachi
PRGS	Proceedings of the Royal Geographical Society, London
PSC–I	First Pakistan Science Conference, 1949
PSC–II	Second Pakistan Science Conference, Karachi, 1950
PSC–III	Third Pakistan Science Conference, Dacca, 1951
PSC–IV	Fourth Pakistan Science Conference, Peshawar, 1952
FSC–VI	Sixth Pakistan Science Conference, Karachi, 1954
PSCJ	Pakistan Science Conference Journal, Lahore, West Pakistan
PTRS	Philosophical Transactions of the Royal Society, London
PZ	Pakistan Ziarat, Karachi
PZS	Proceedings of the Zoological Society, London
QR	Quarterly Review, London
RAS	Royal Asiatic Society, Prize Publication Fund, London
RASM	Royal Asiatic Society, Mongraphs, London
RBGN	Royal Botanic Garden, Notes, Edinburgh
RGSP	Records of the Geographical Survey of Pakistan, Karachi
SC	Science and Culture, Calcutta
SJA	Southwestern Journal of Anthropology, Albuquerque, New Mexico
SK	Scientist, Karachi
SNL	Science News Letter, Washington, D. C.
SOAW	Sitzungsberichte der Oesterreichischen Akademie der Wissenschaften, Vienna
SRBG	Selected Records, Bombay Government
SRPG	Selected Records of the Punjab Government, Lahore
TLSL	Transactions, Linnæan Society, London
UBJ	University of Bombay, Journal
UM	University of Miami Press, Coral Gables, Florida
WC	World Crops, London
WDWT	World Dominion and the World Today, London
ZA	Zoologischer Anzeiger, Leipzig
ZE	Zeitschrift für Ethnologie, Berlin and Brunswick
ZMGP	Zentralblatt für Mineralogie, Geologie und Paläontologie, Stuttgart

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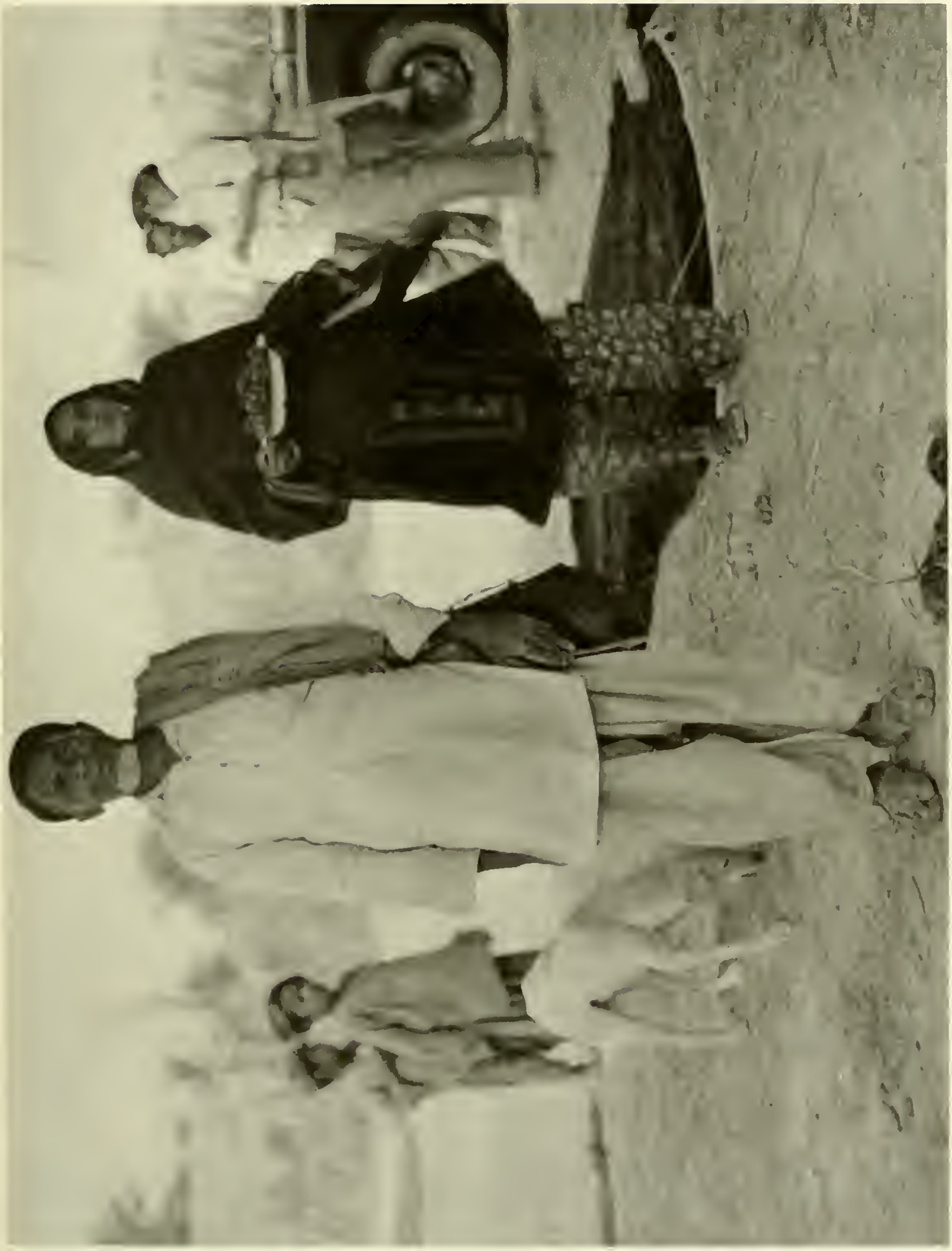
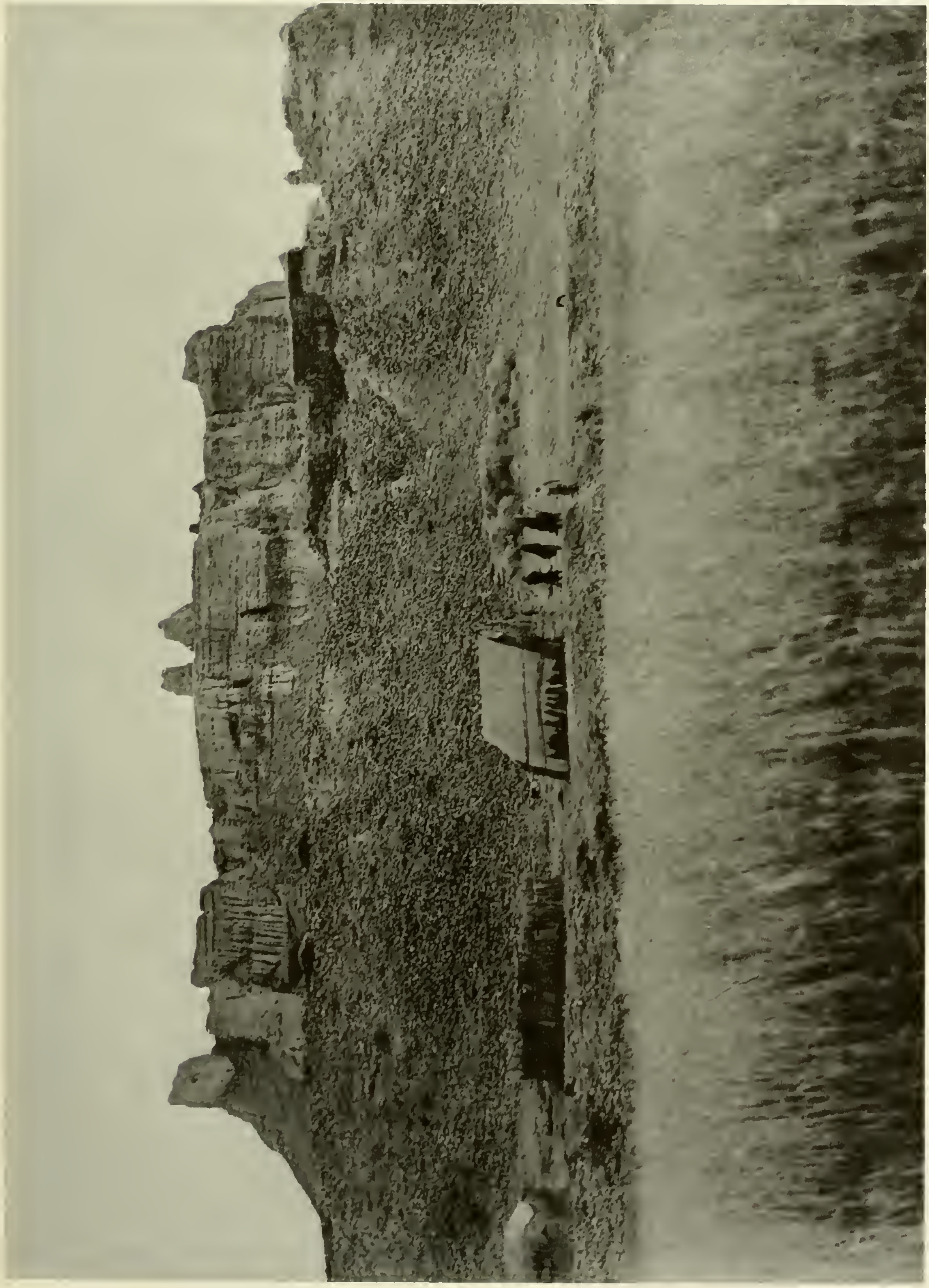


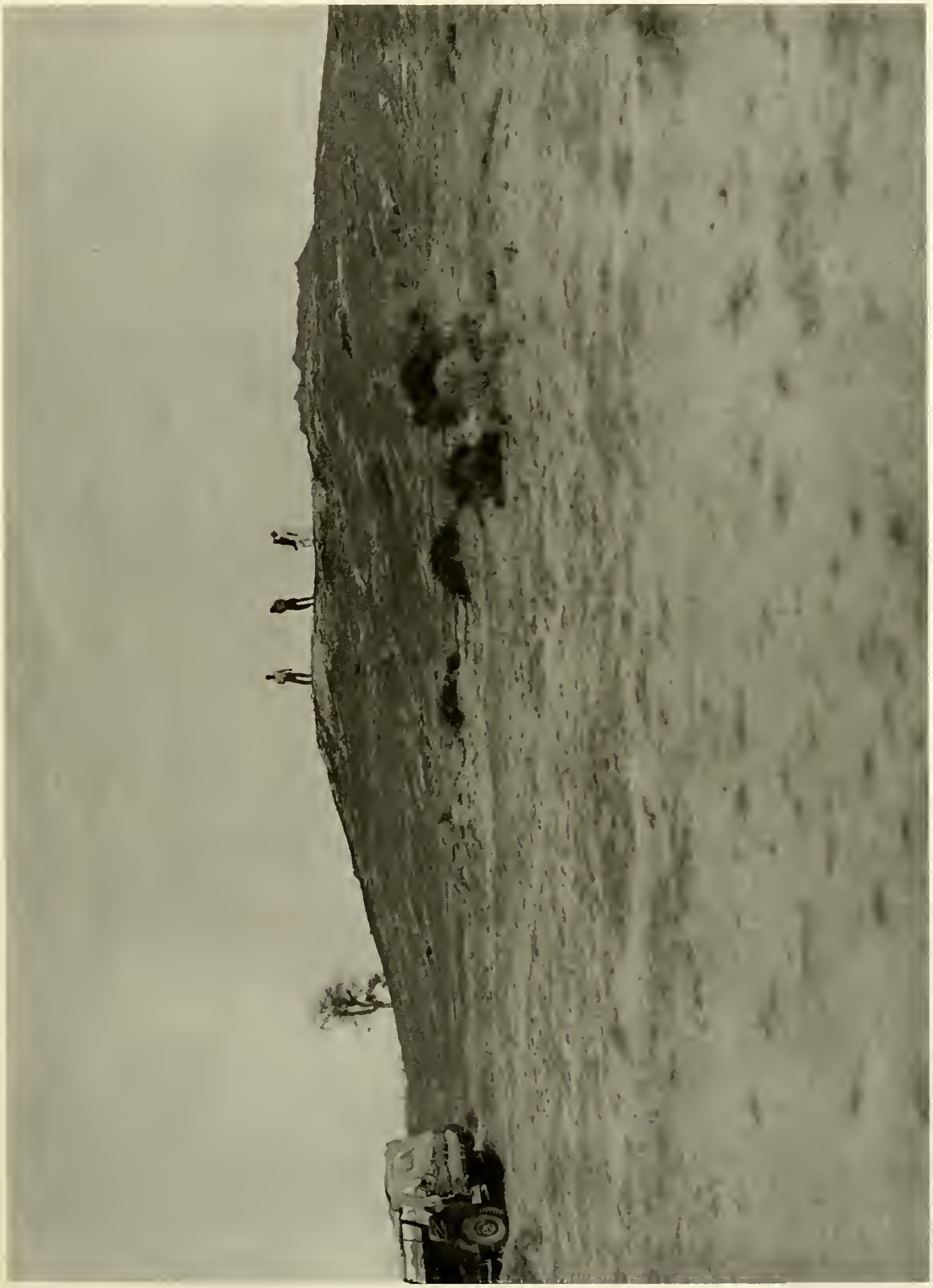
Baluchi with dates in Nodiz between Turbat and Mand.

Hasham drinking from irrigation ditch below Miri Fort near Turbat.



View of Miri Fort with thatched huts in foreground.

Eroded platy limestone between Hoshab and Panjgur.

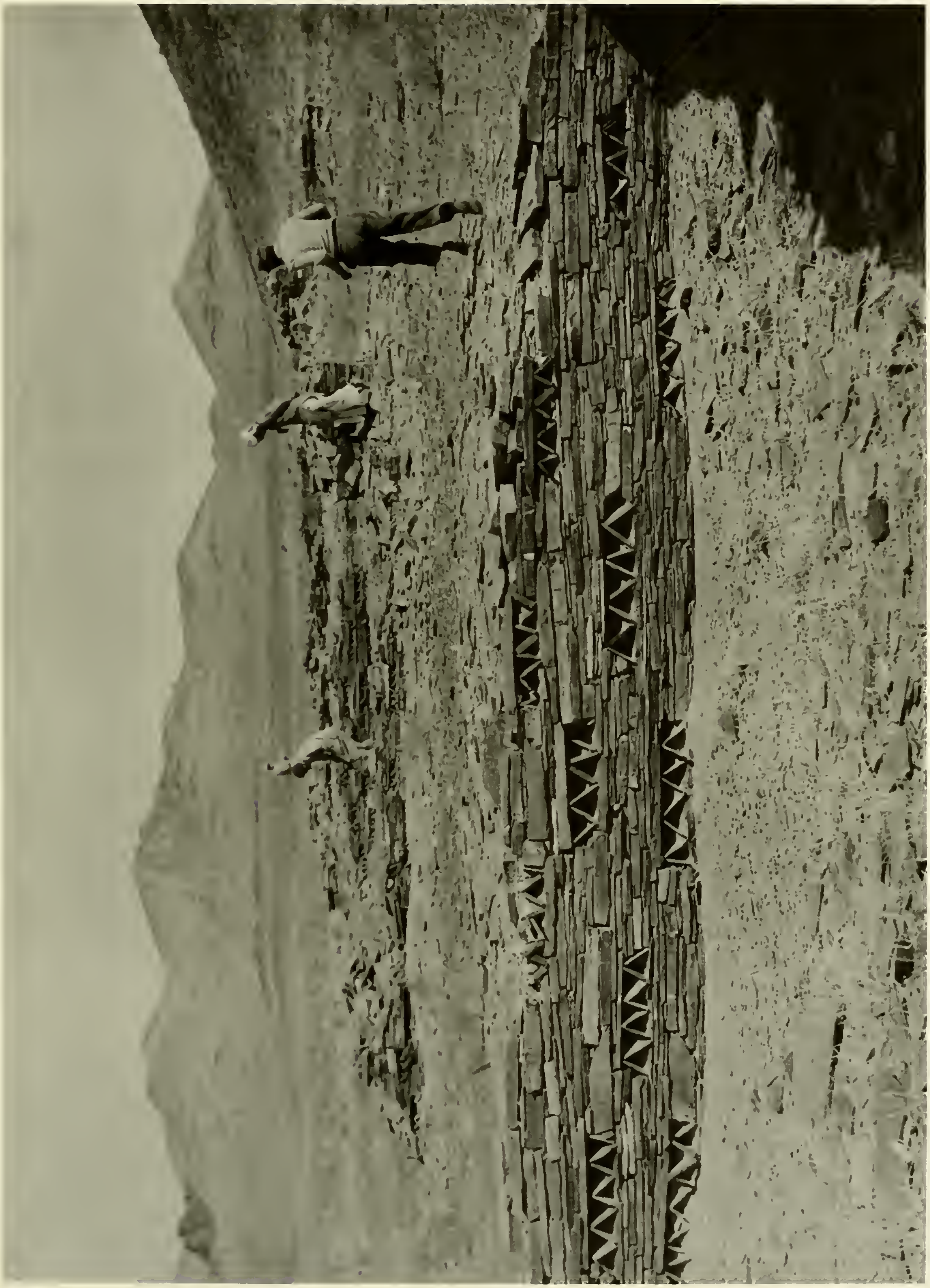


Surain-Damb, 28 miles south of Panjgur.

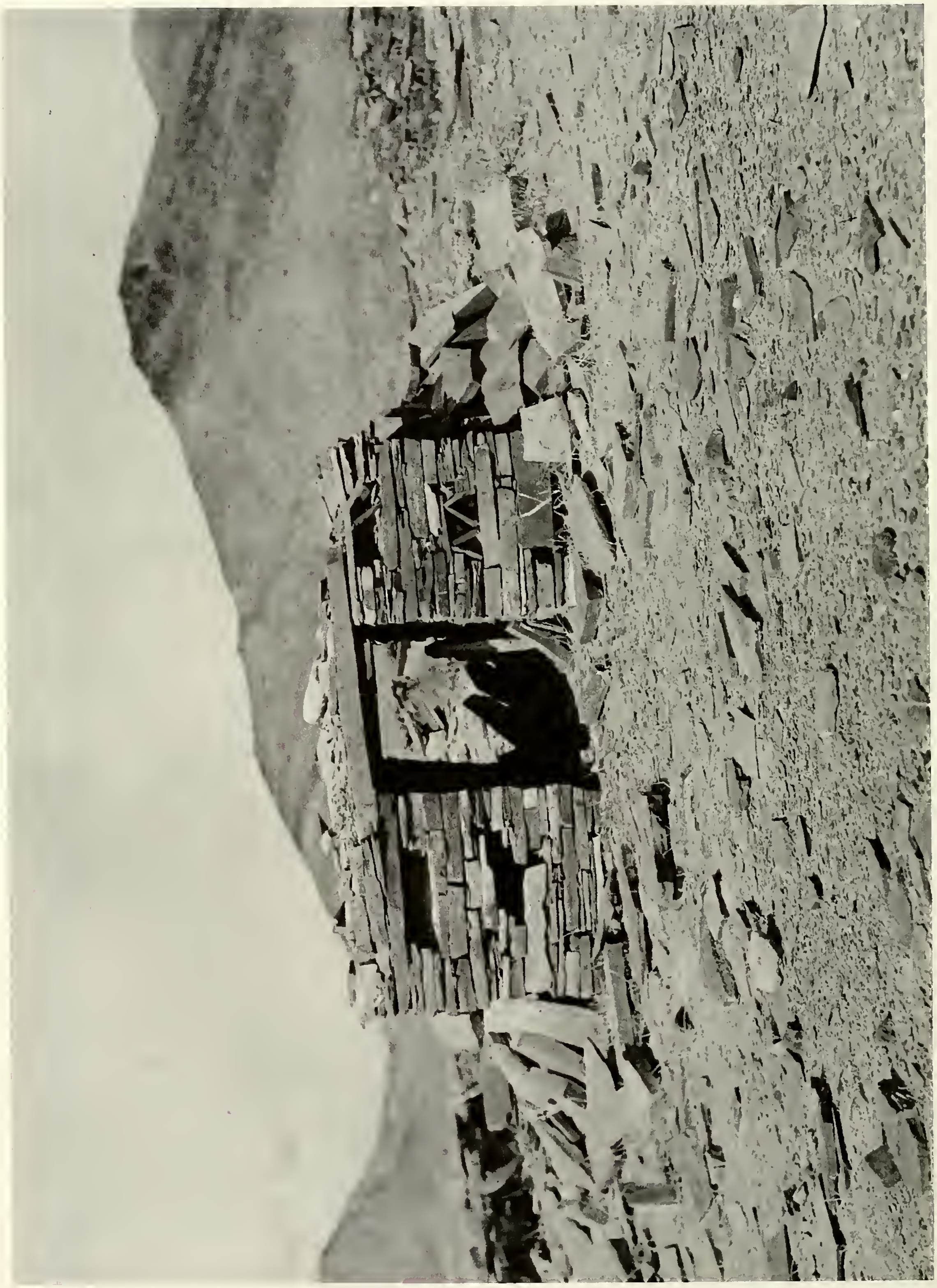
Excavations at Surain-Damb. Henry Field supervising workmen.

Hills between Panjgur and Nag.

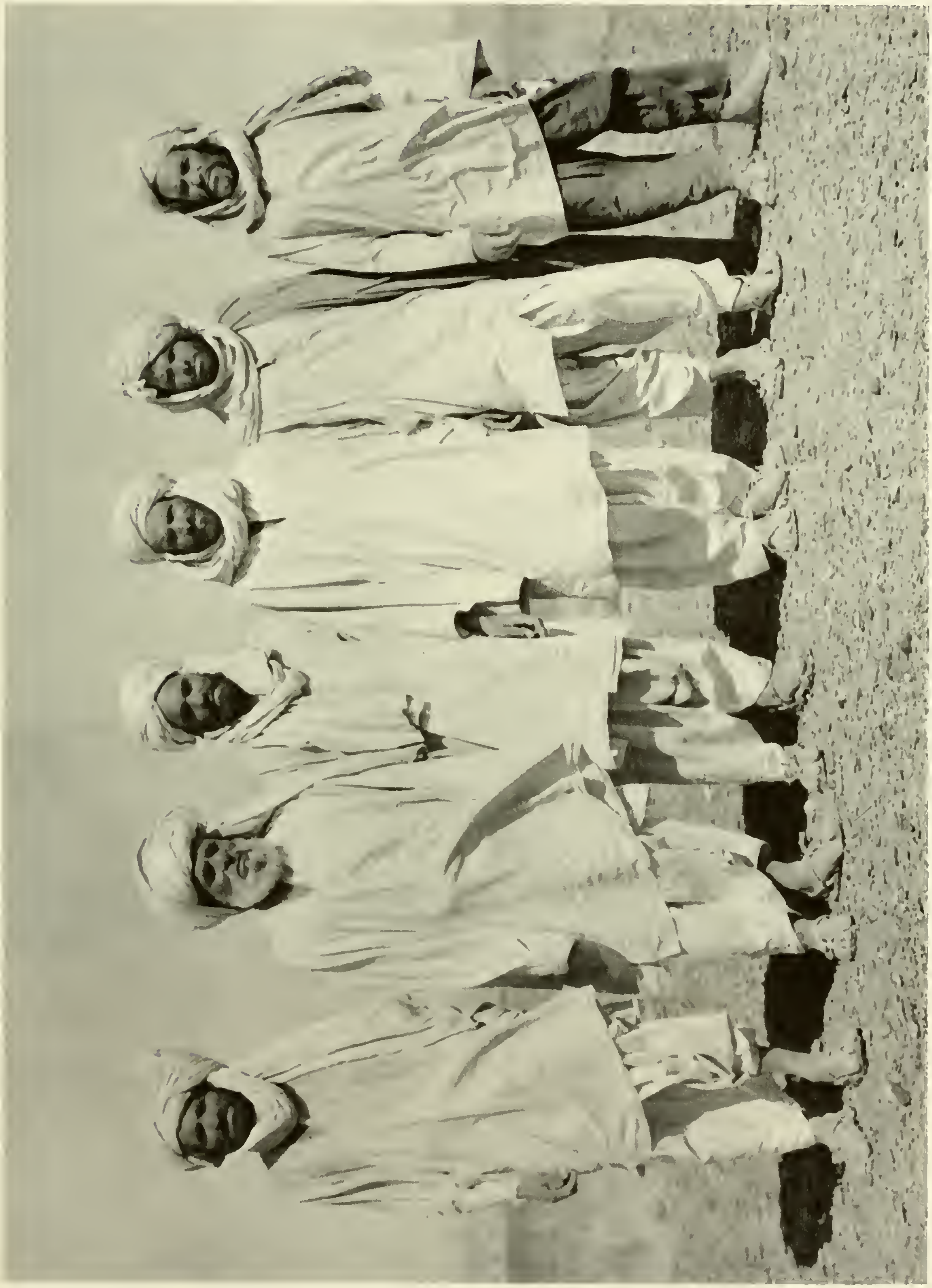
Pir Mohammed beside stream one mile north of Nag.



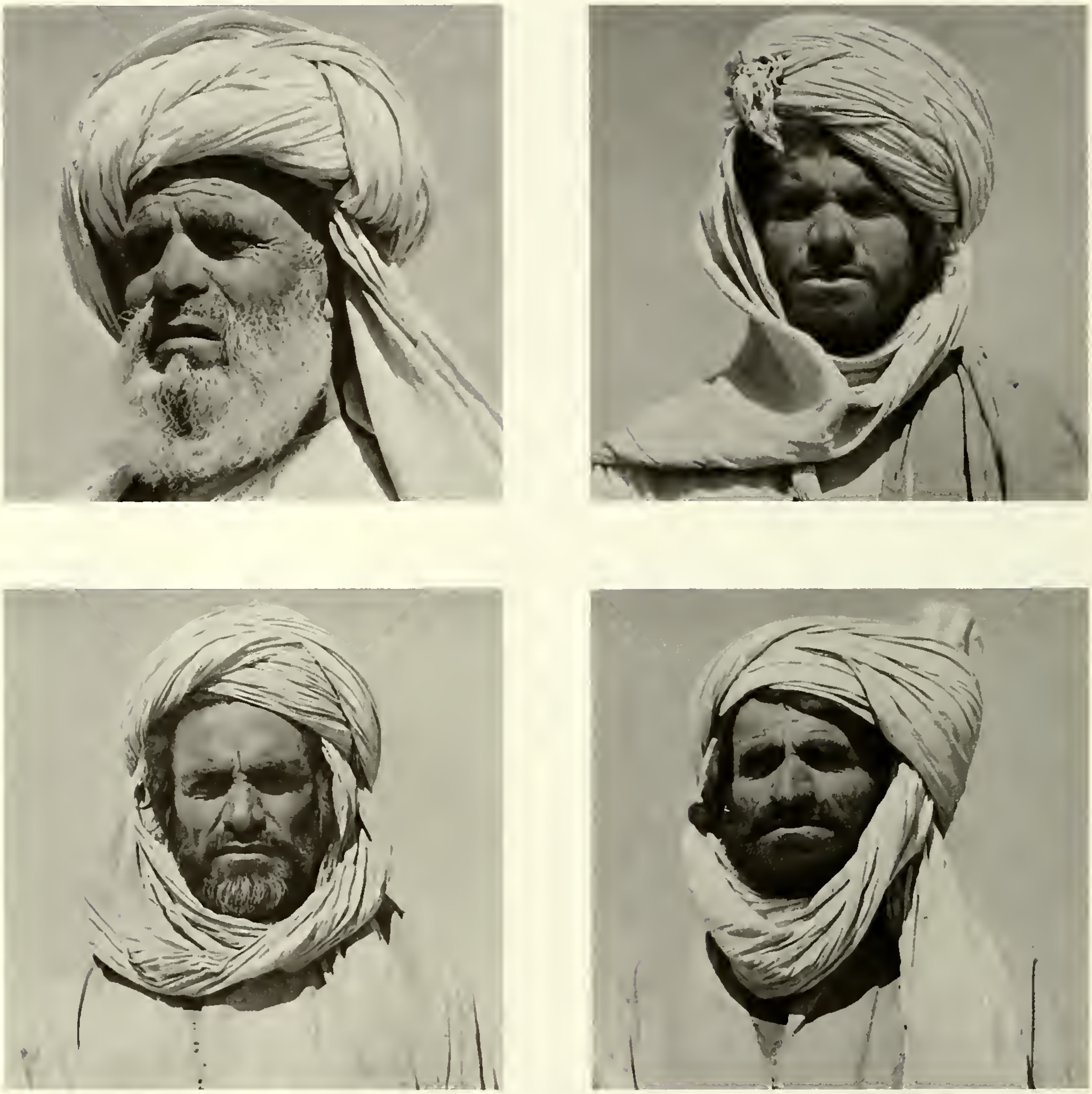
Graves between Nag and Jangal. Mohammed Idris Saddiqi, archæologist; Hasham, snake charmer; and Naeem Beg Chugtai, zoologist.



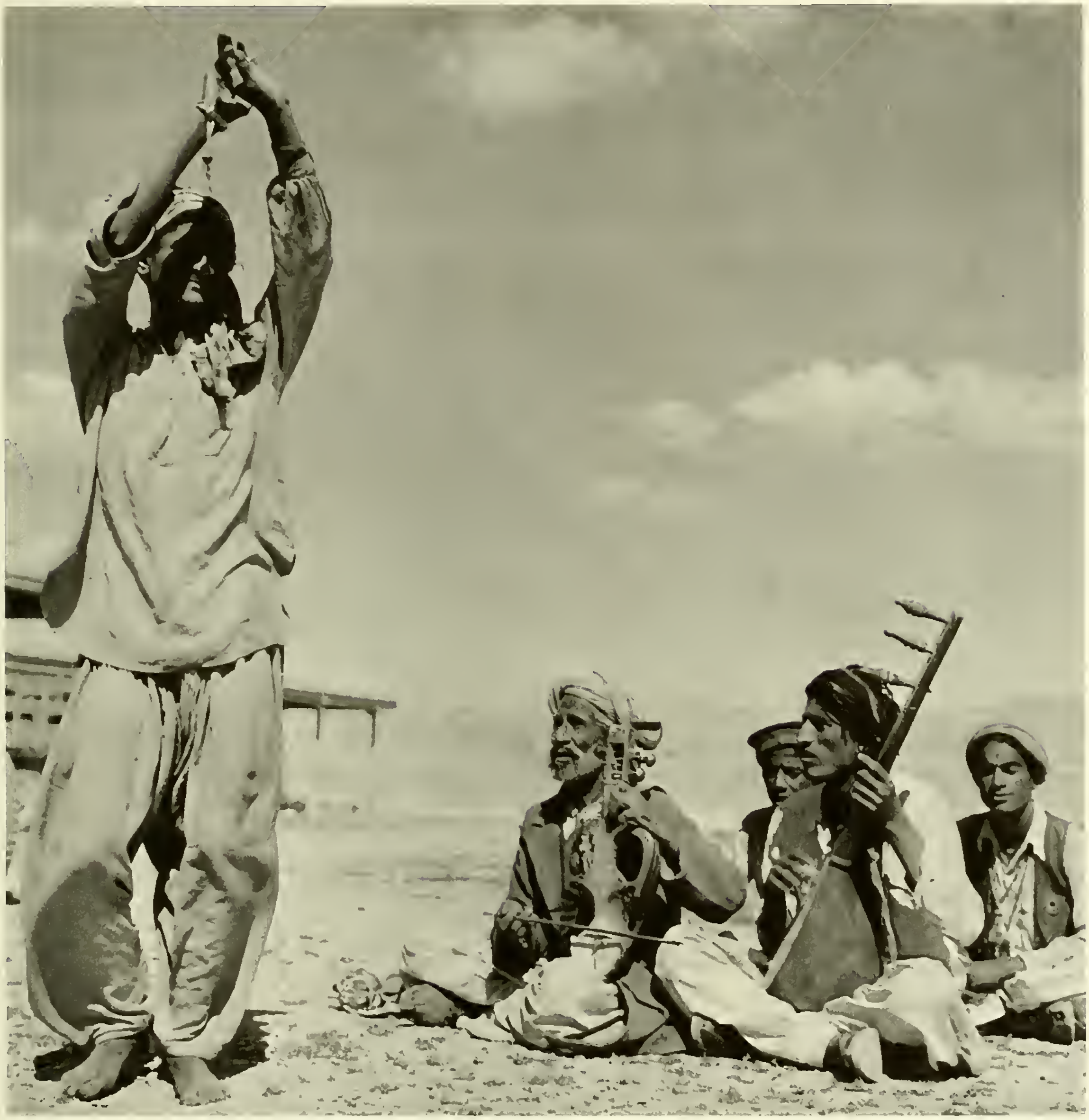
Grave entrance between Nag and Jangal (*see* fig. 53).



Six Mamassani near Seri-Damb.

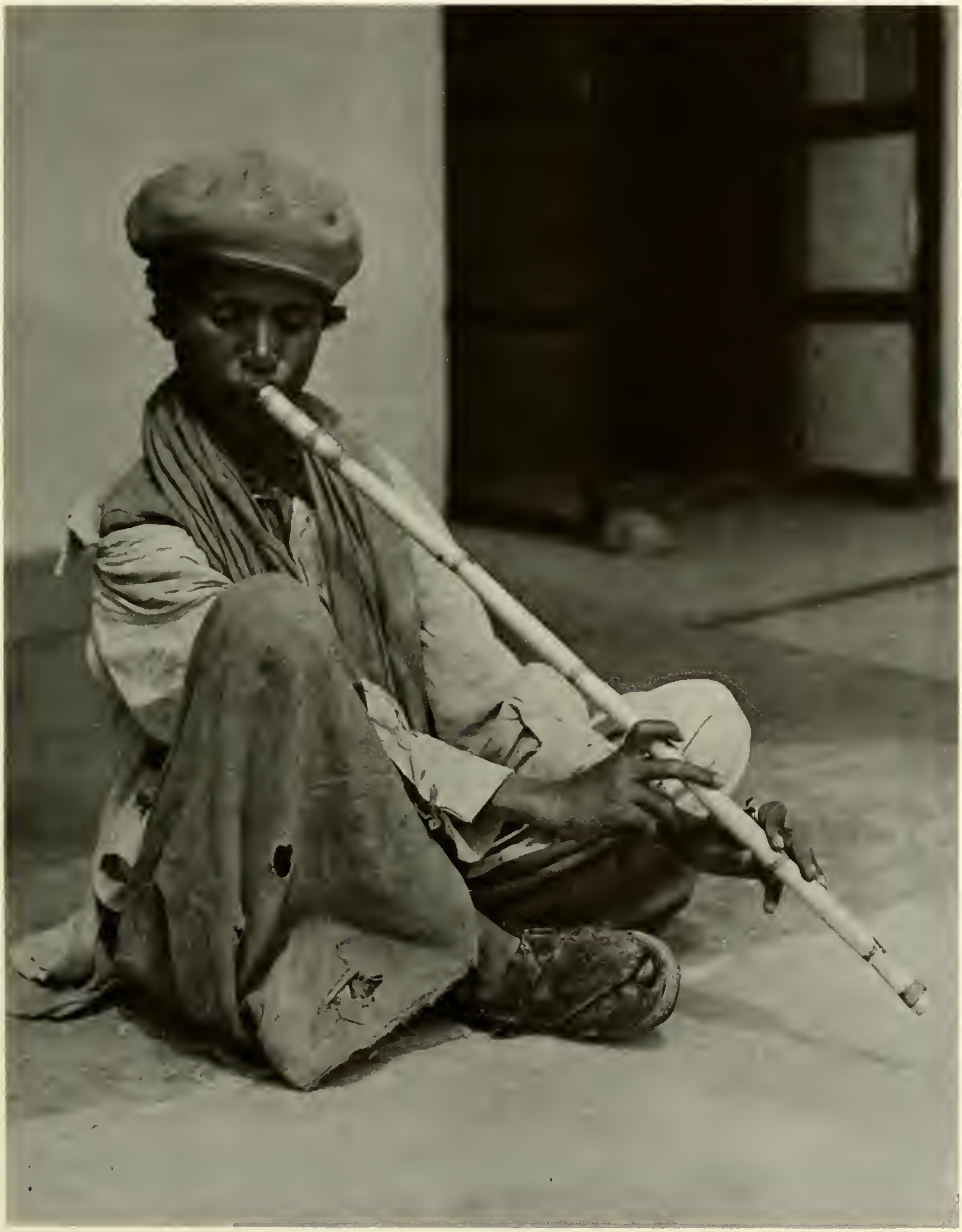


Mamassani.

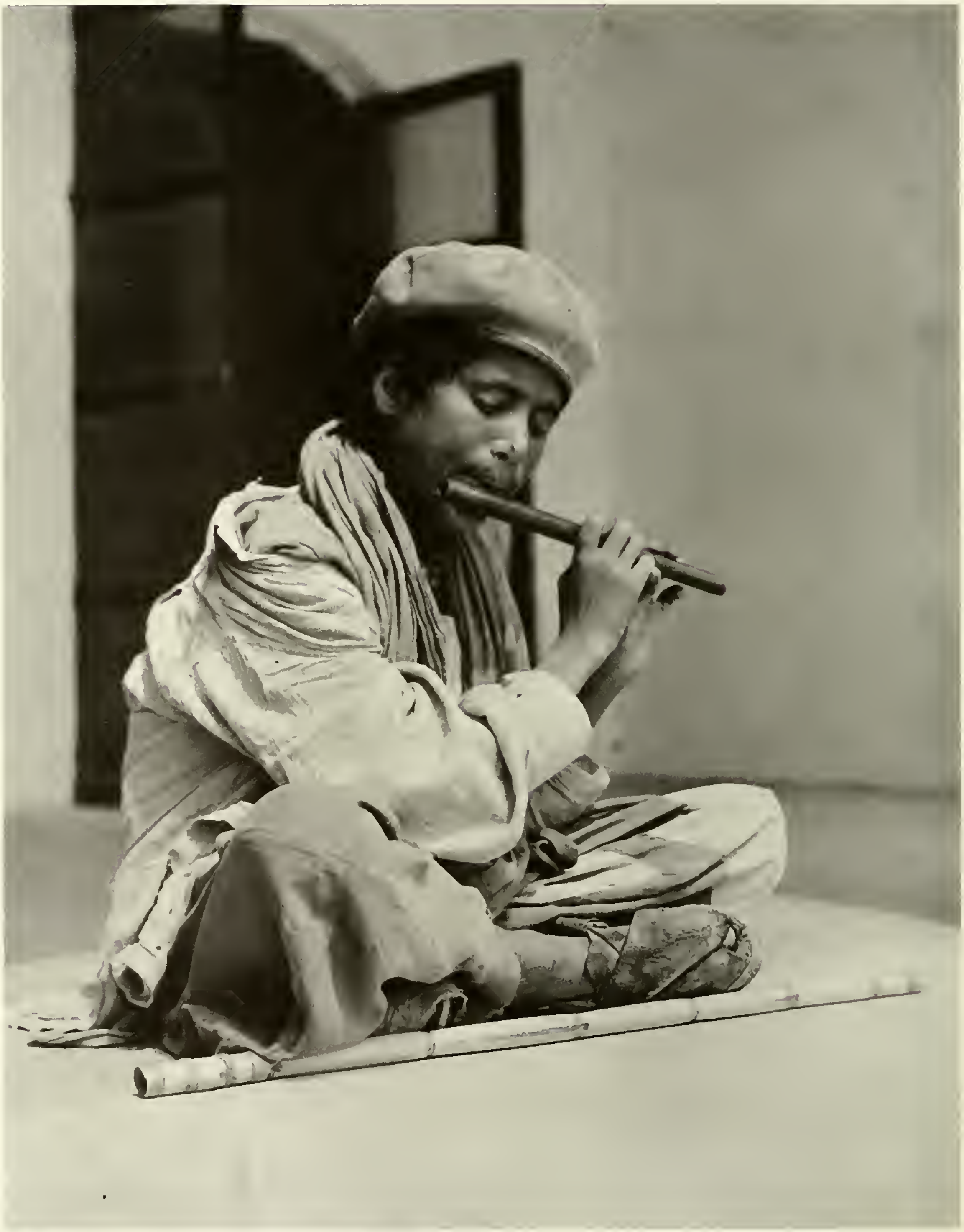


Musicians and dancer near Kalat Rest House.

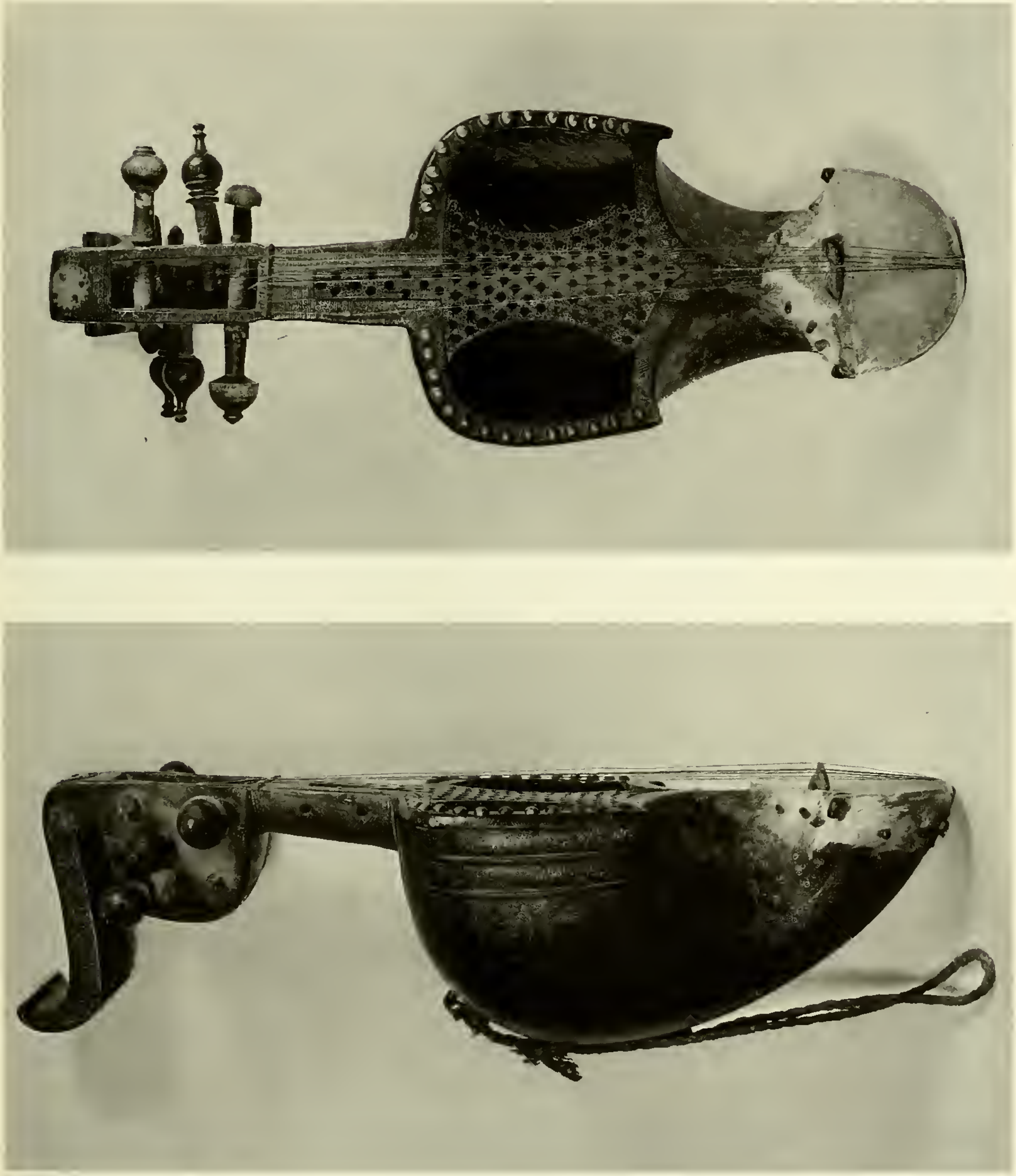
Mastung garden.



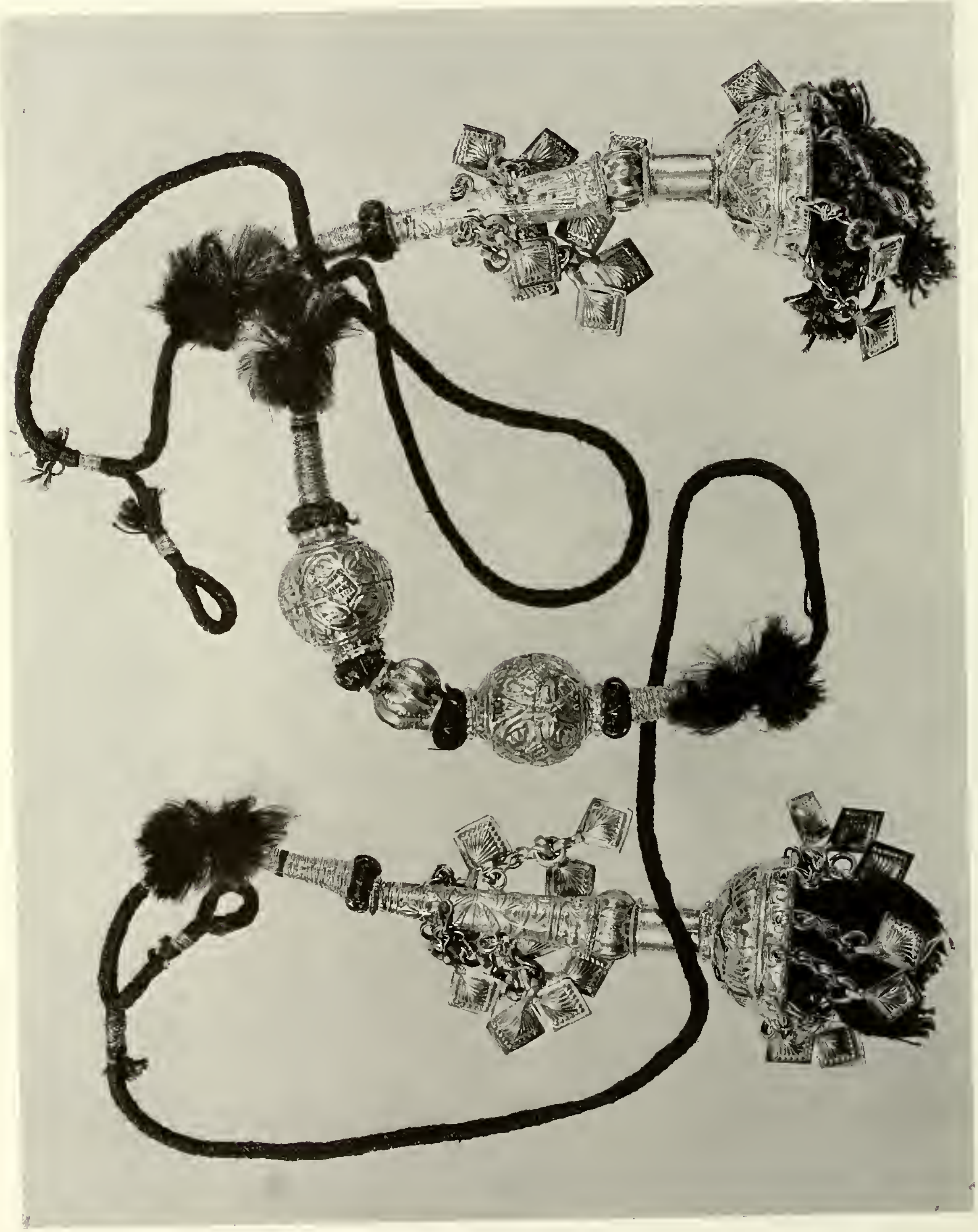
Sheikh Wala, blind boy with long flute, at Panjgur.



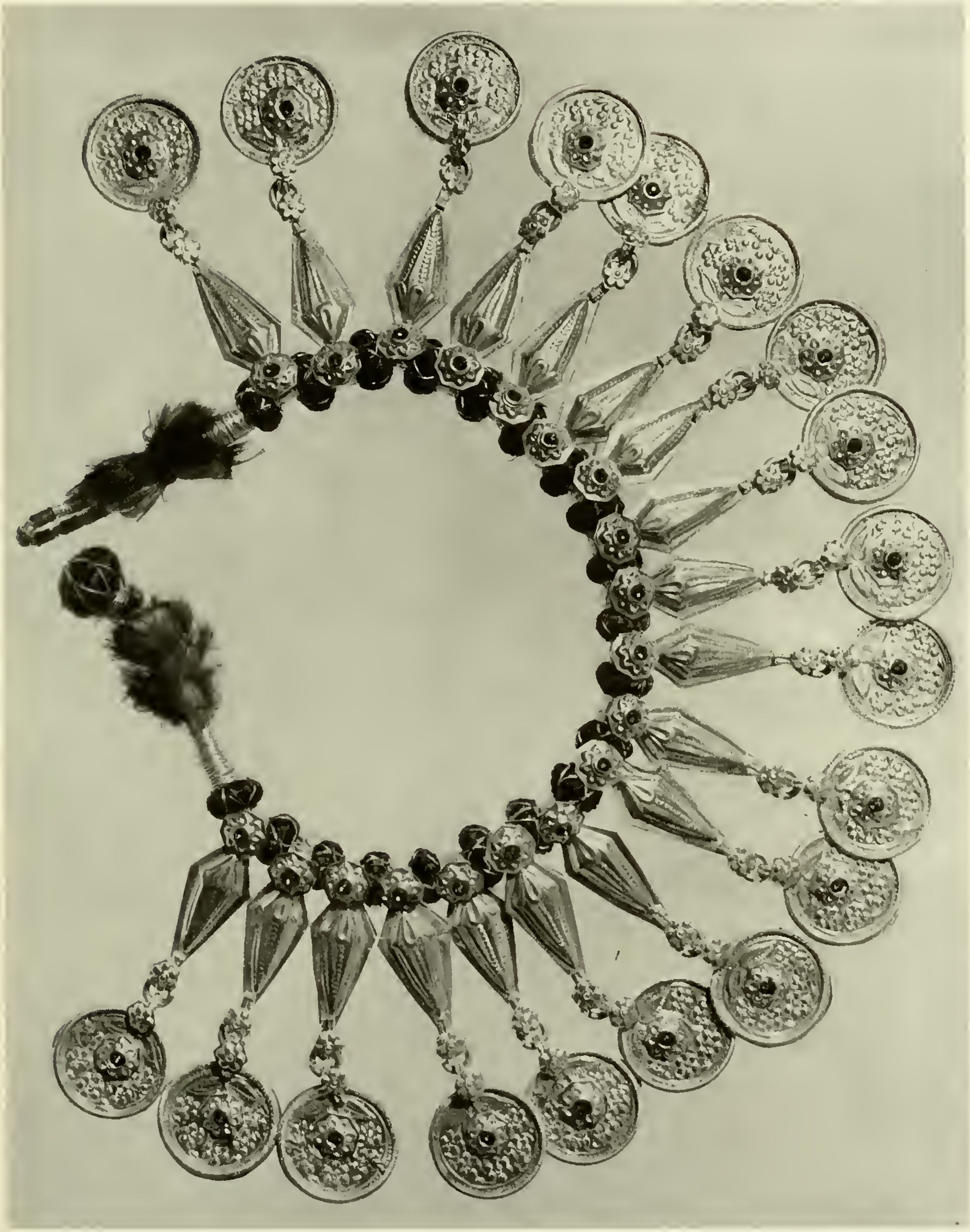
Sheikh Wala, blind boy with short flute, at Panjgur.



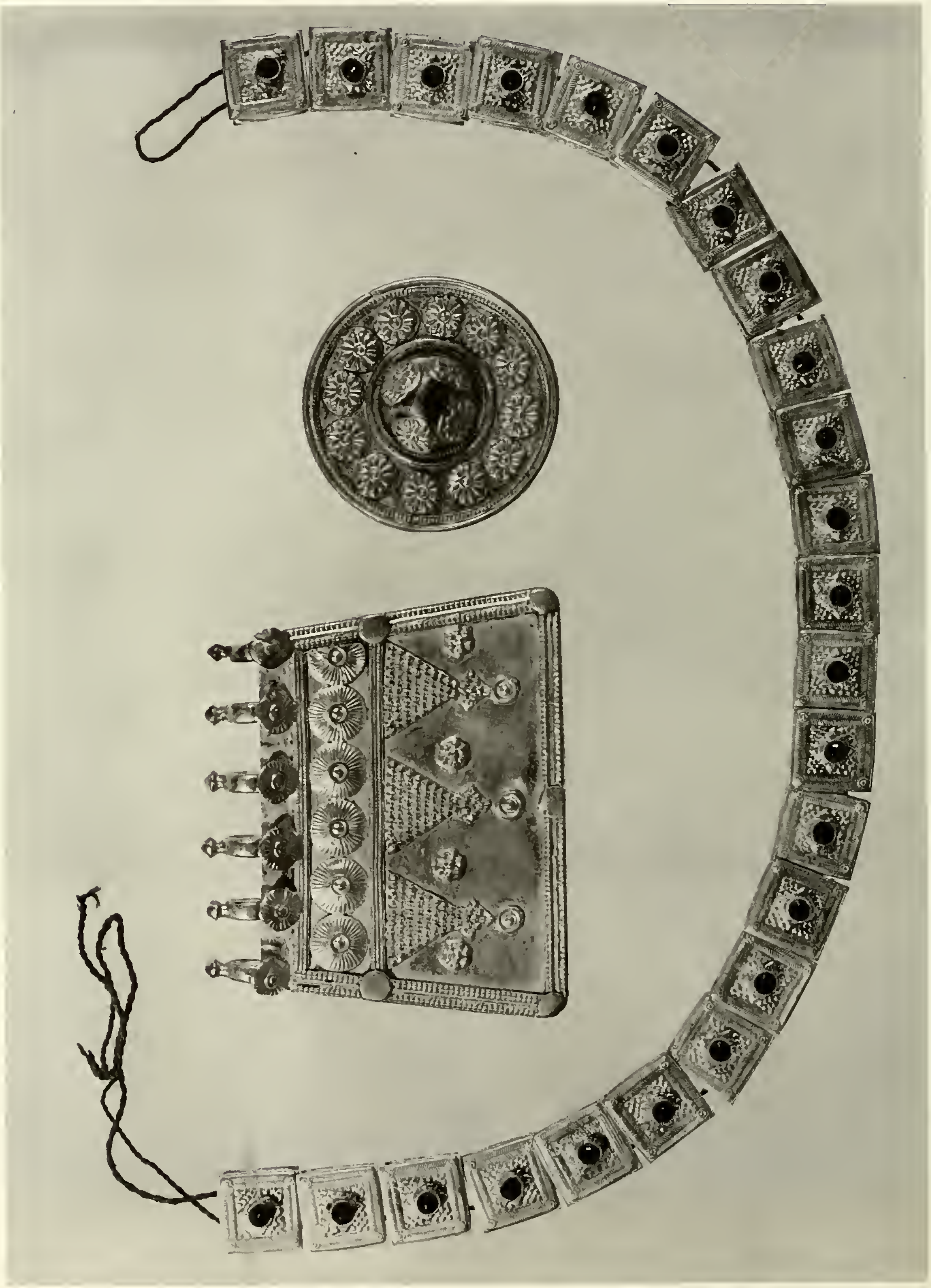
Musical instrument (*sarinda*).



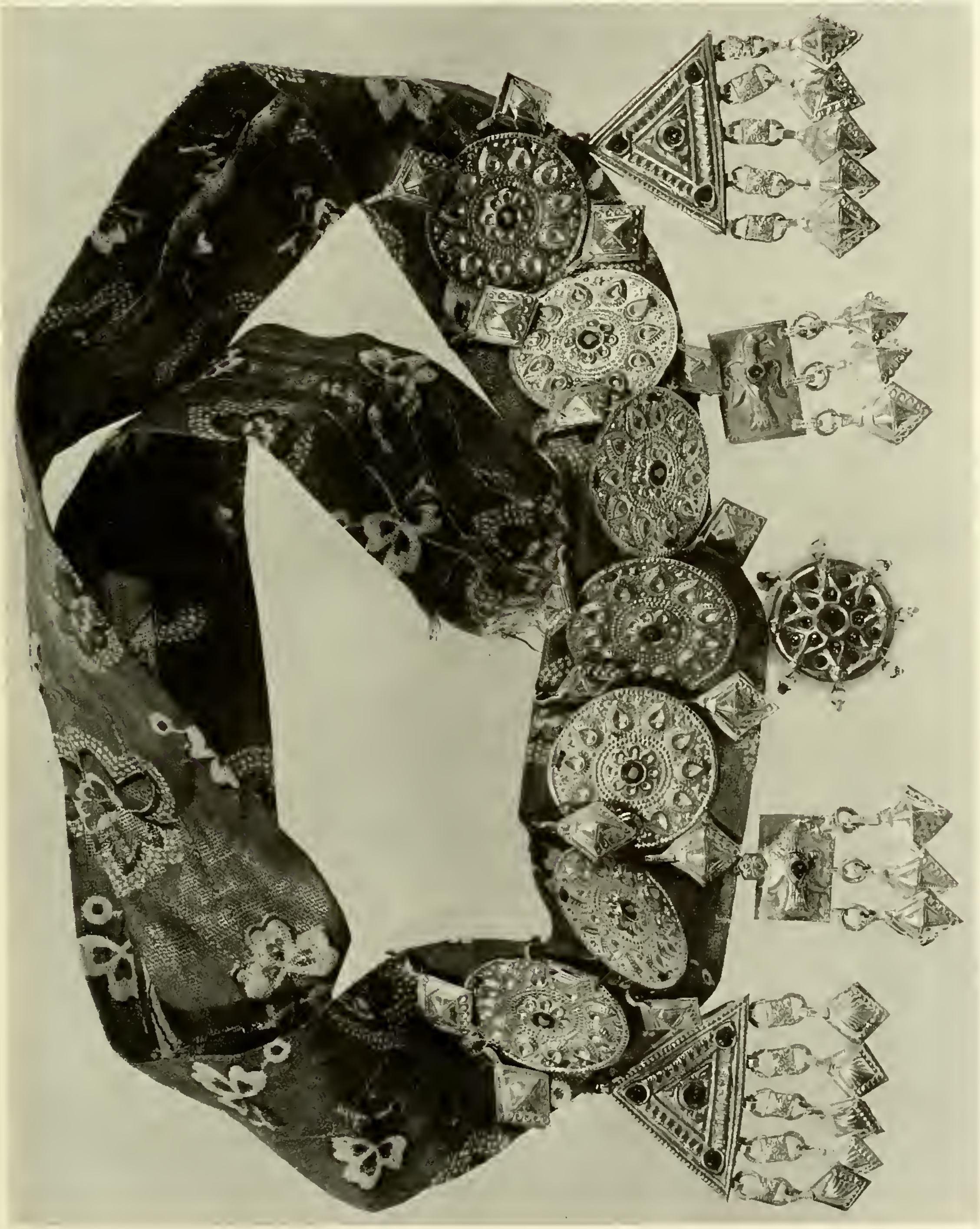
Braid ornaments from Kalat.



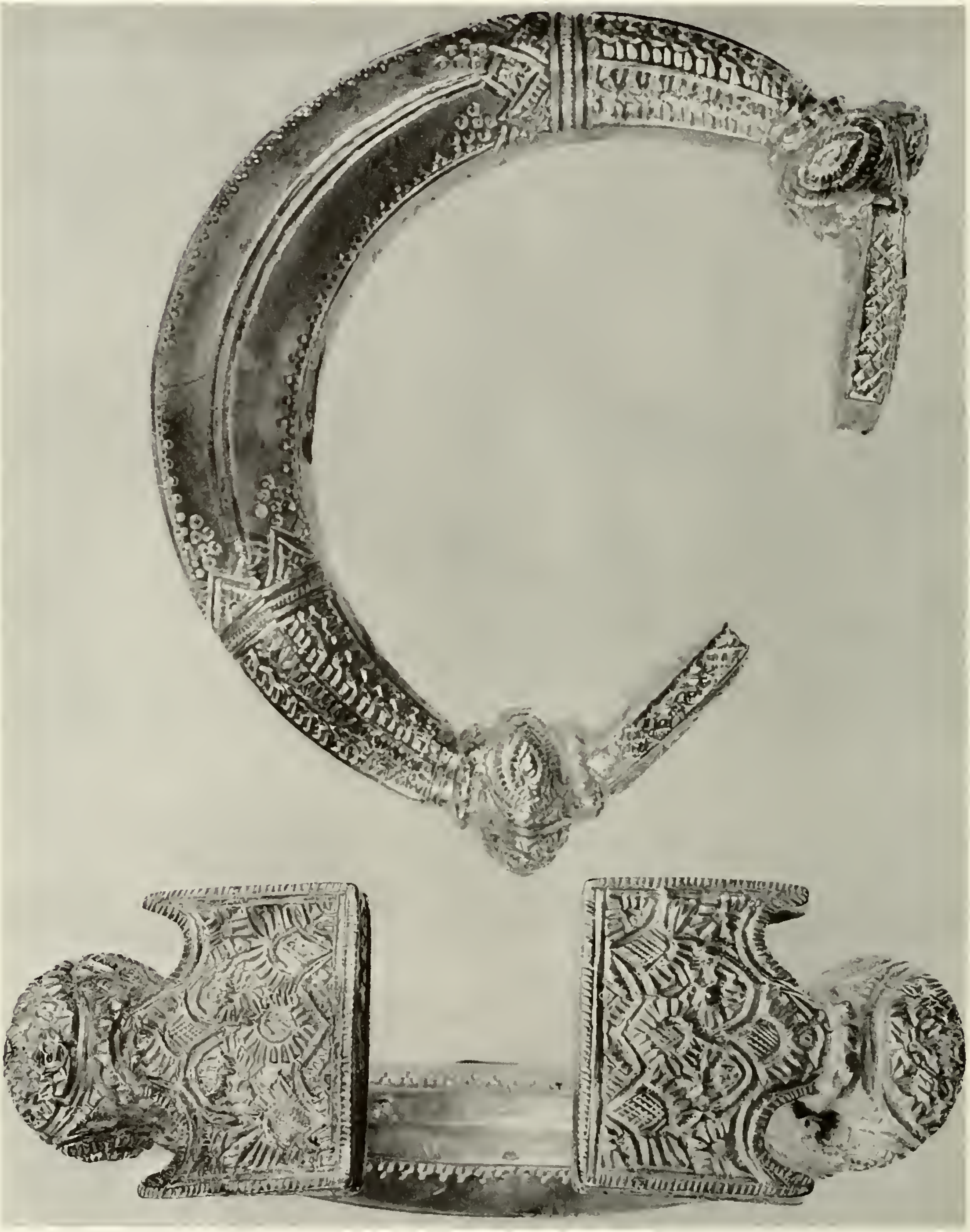
Necklace from Kalat.



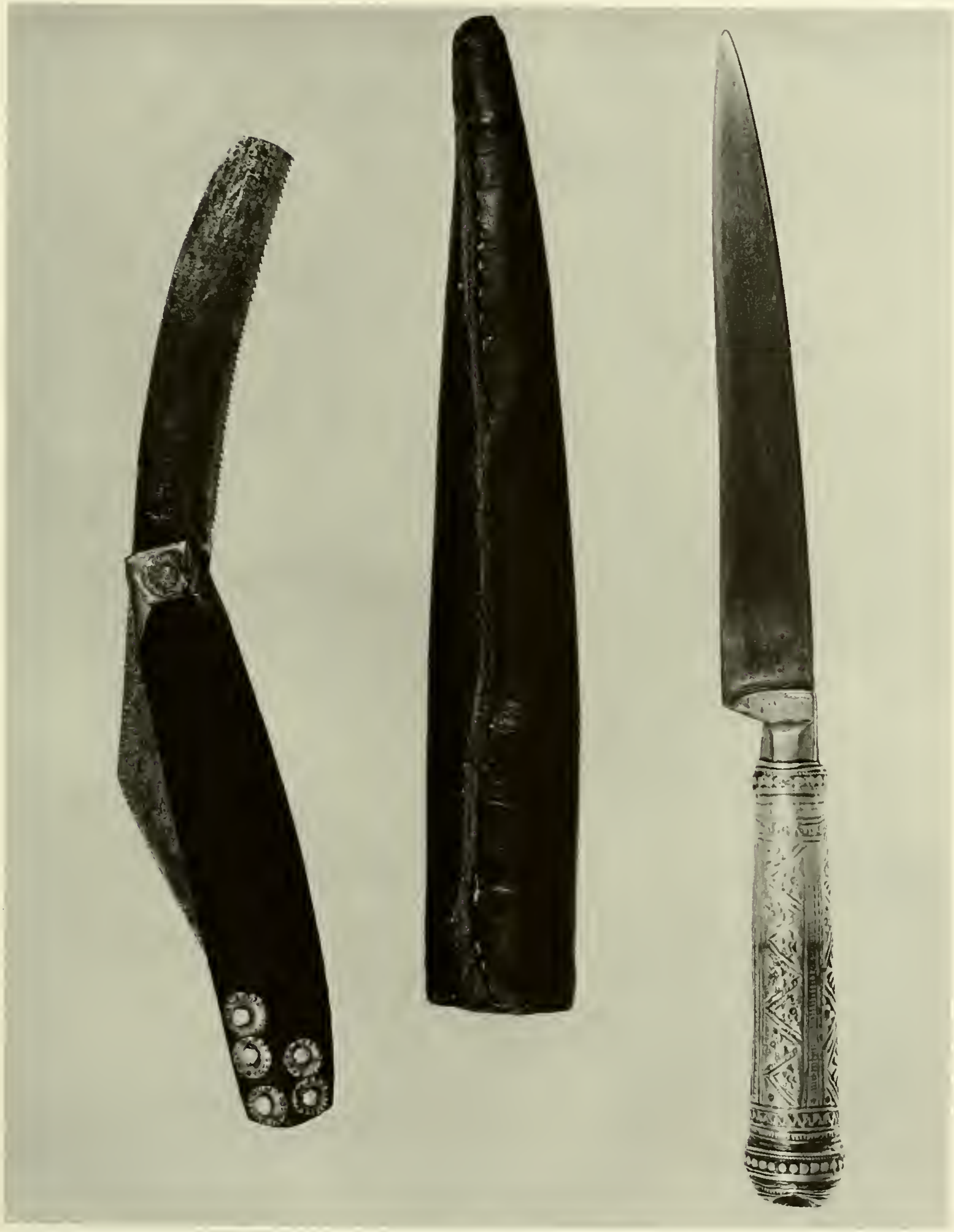
Necklace from Kalat.



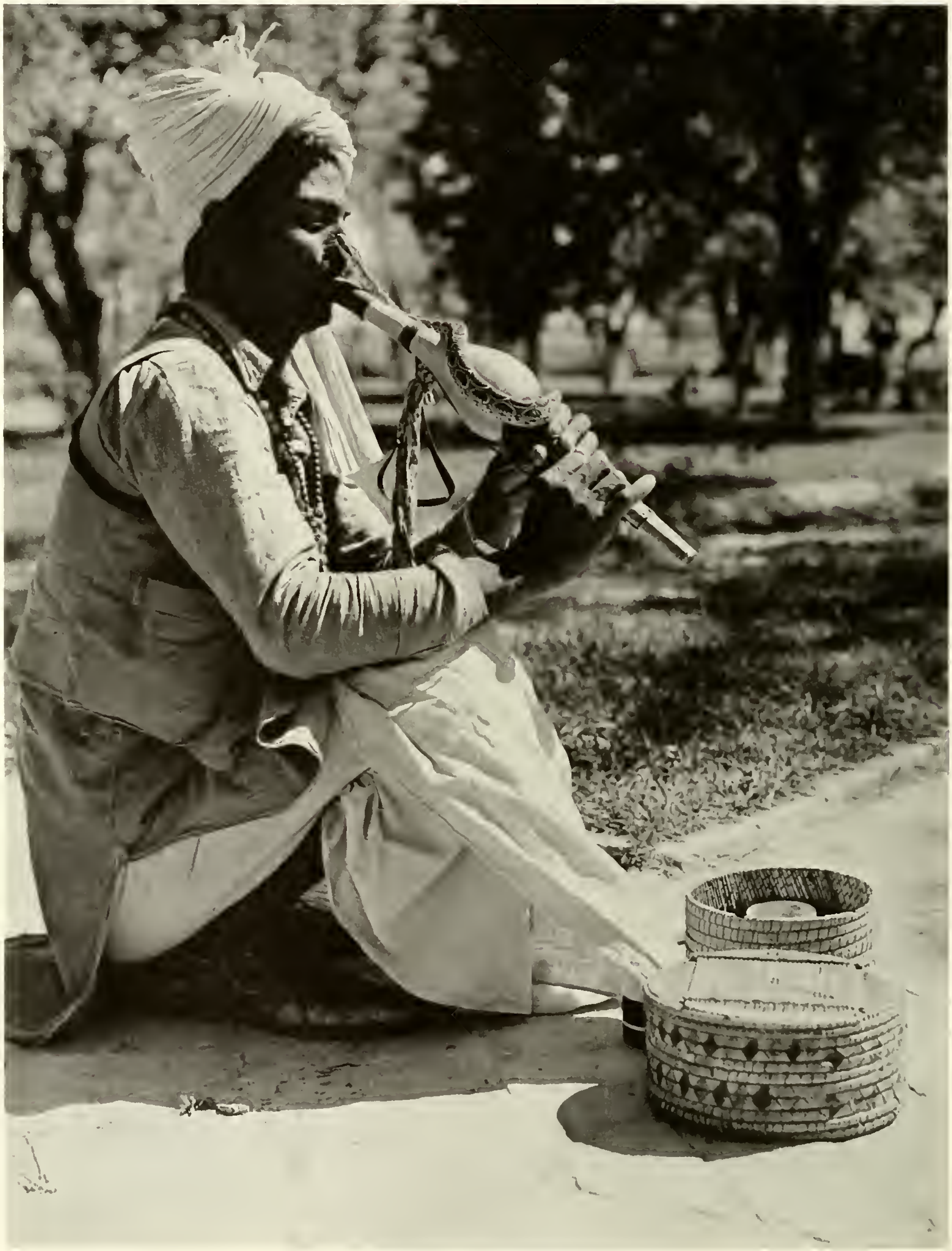
Headband from Kalat.



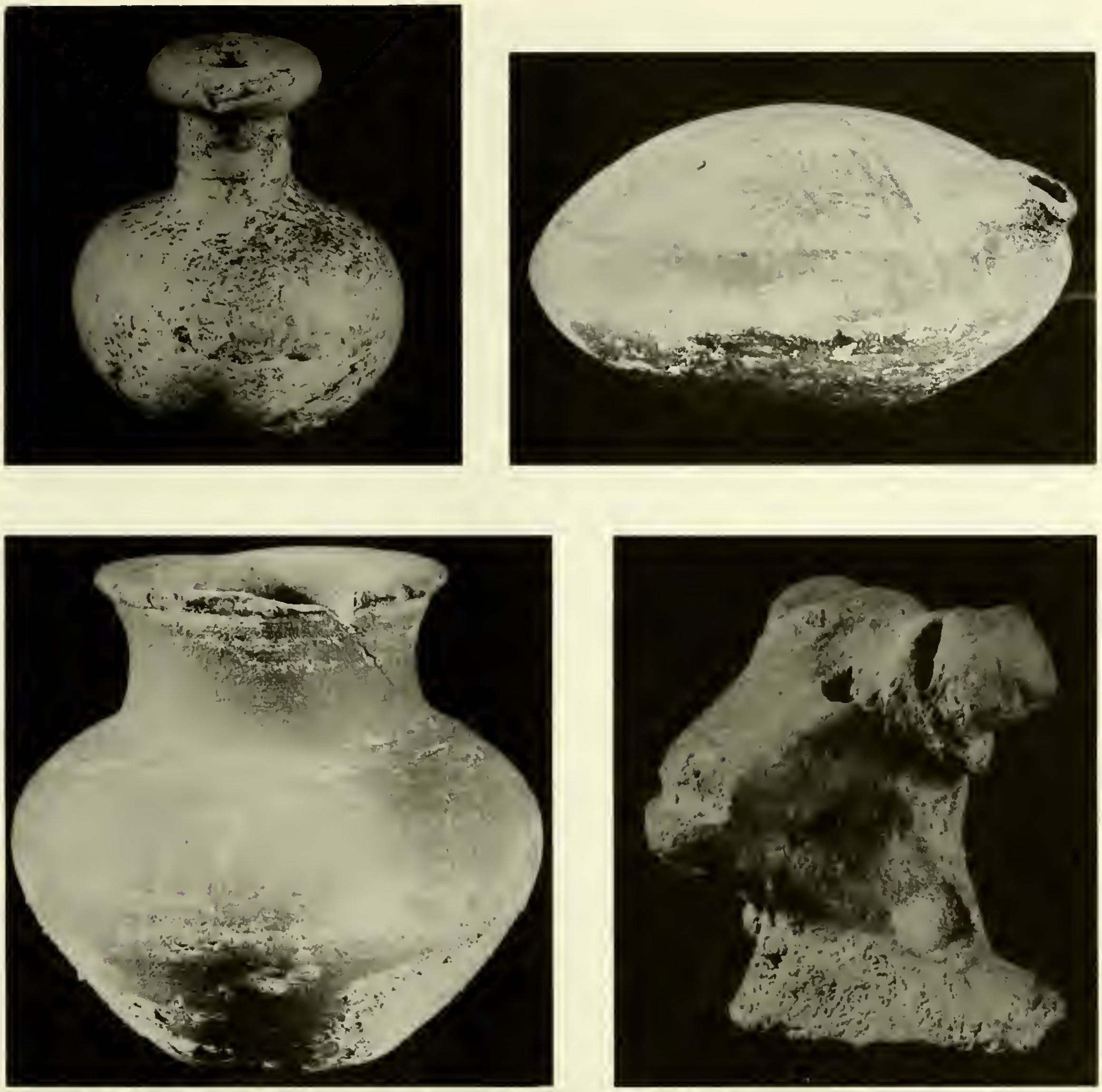
Anklets from Kalat.



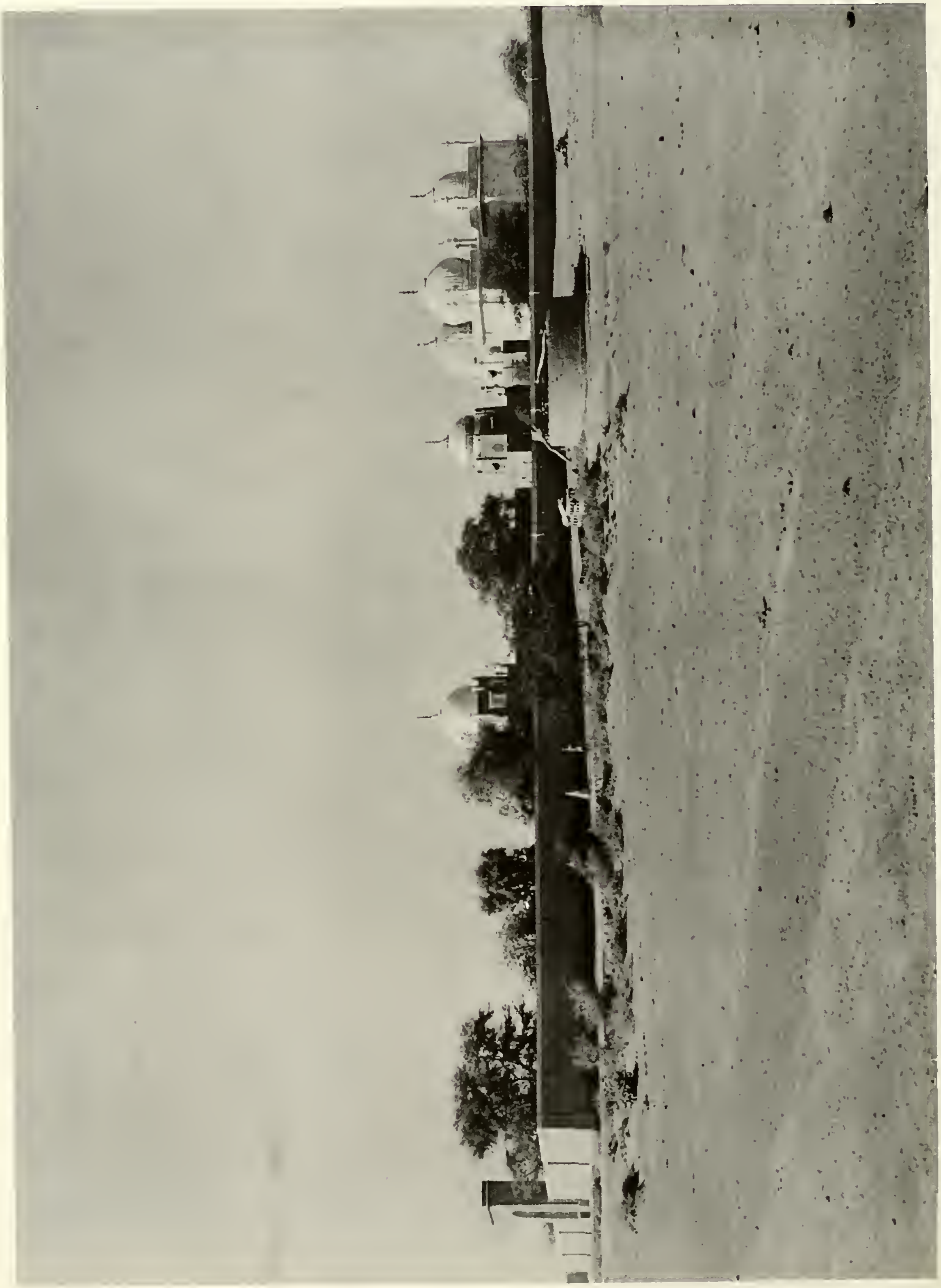
Brahui knives from Mastung.



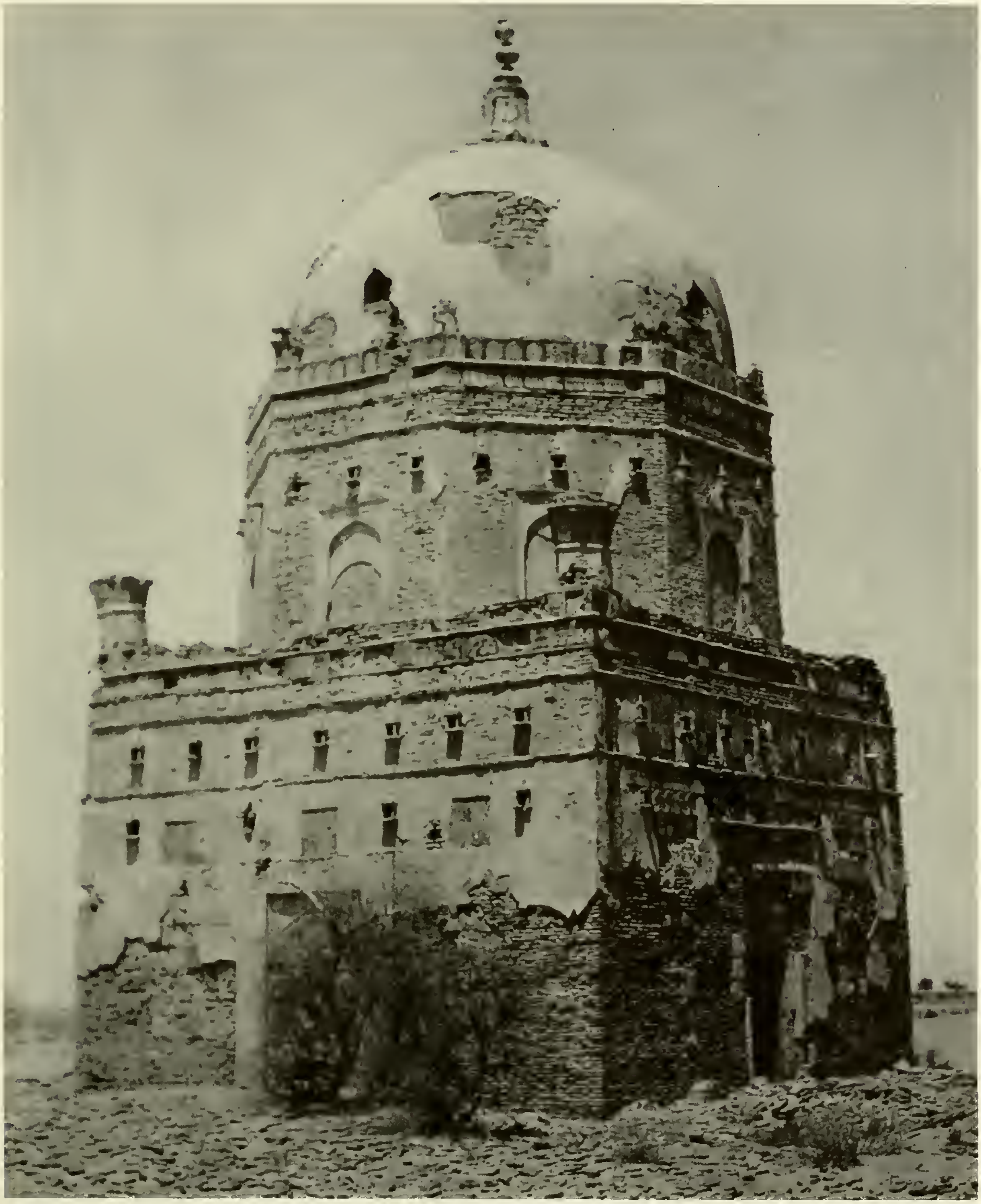
Hasham, snake charmer from Tatta, Sind.



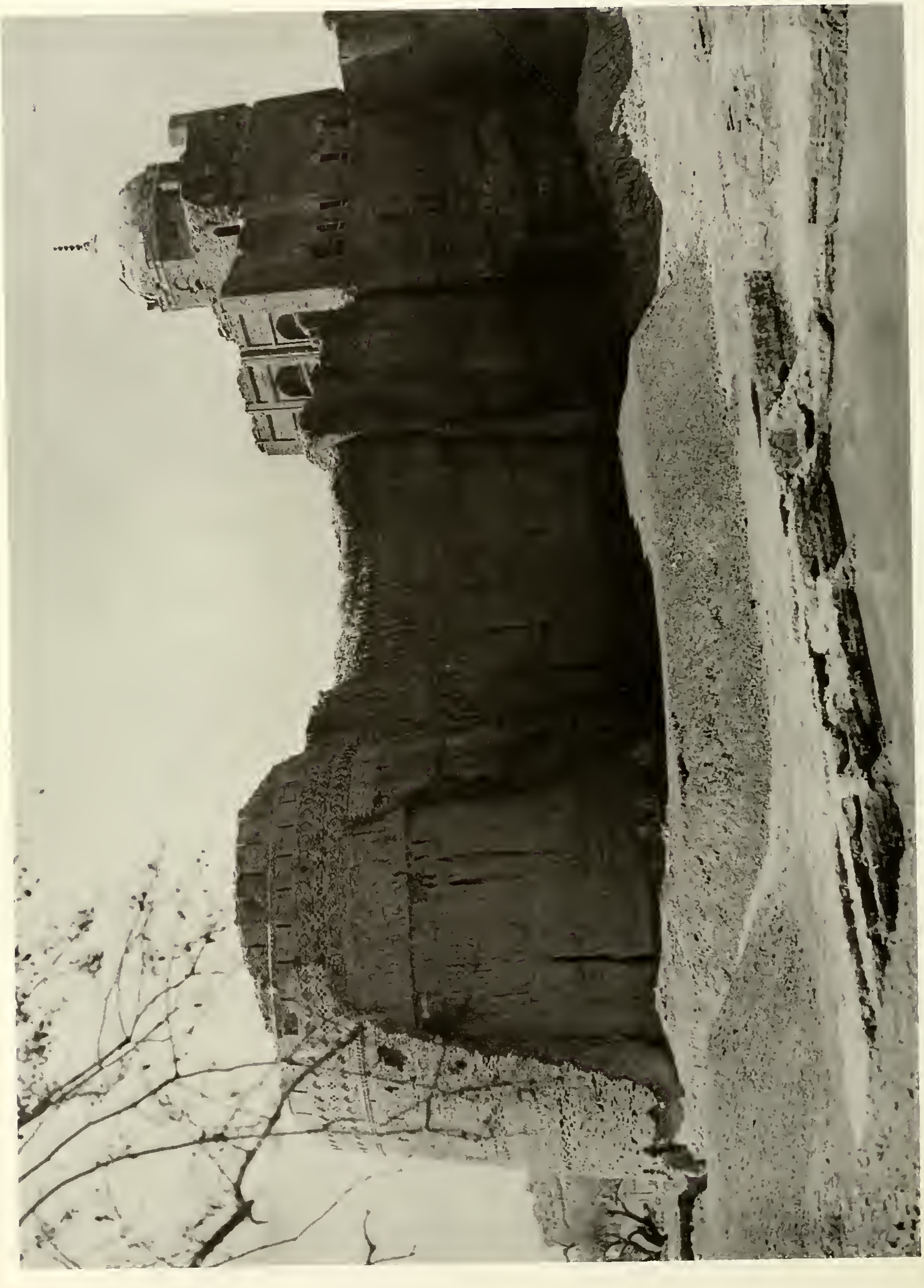
Pottery from Nushki, Baluchistan.



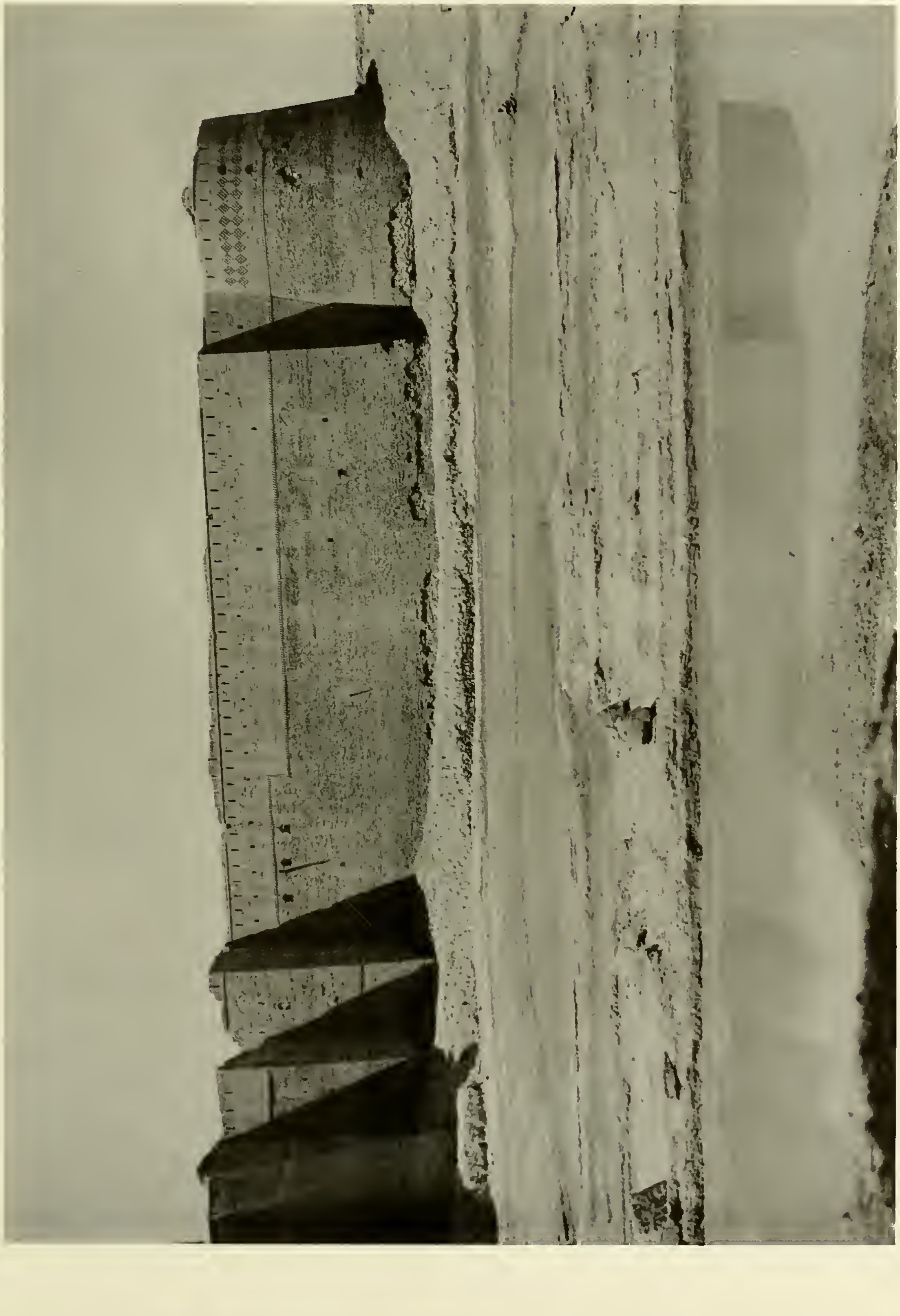
Tombs of Nawabs of Bahawalpur near Fort Derawar.



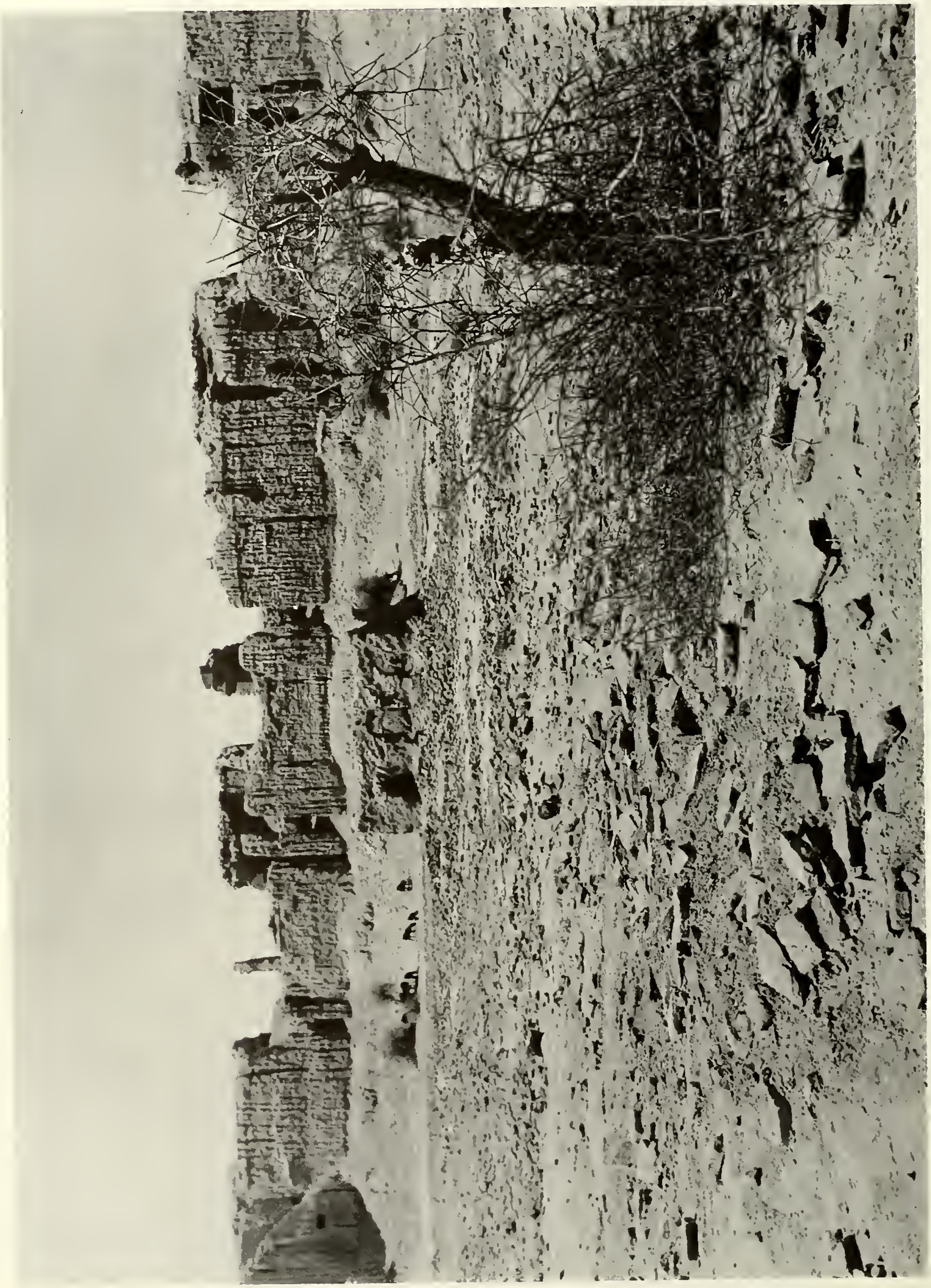
Tomb of Muhammad Maruf Khan near Fort Mojgarh.



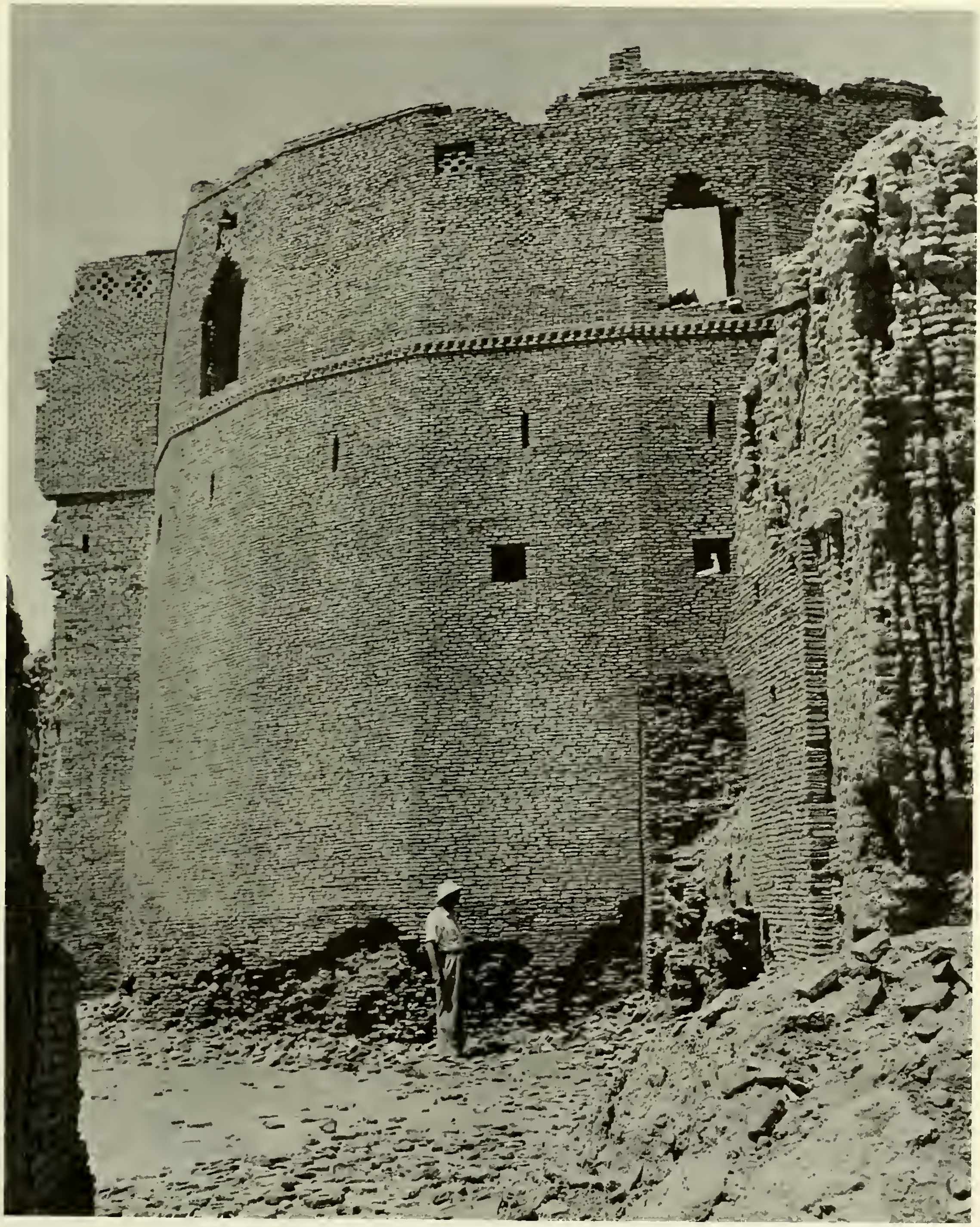
Fort Mojgarh with mosque on right.



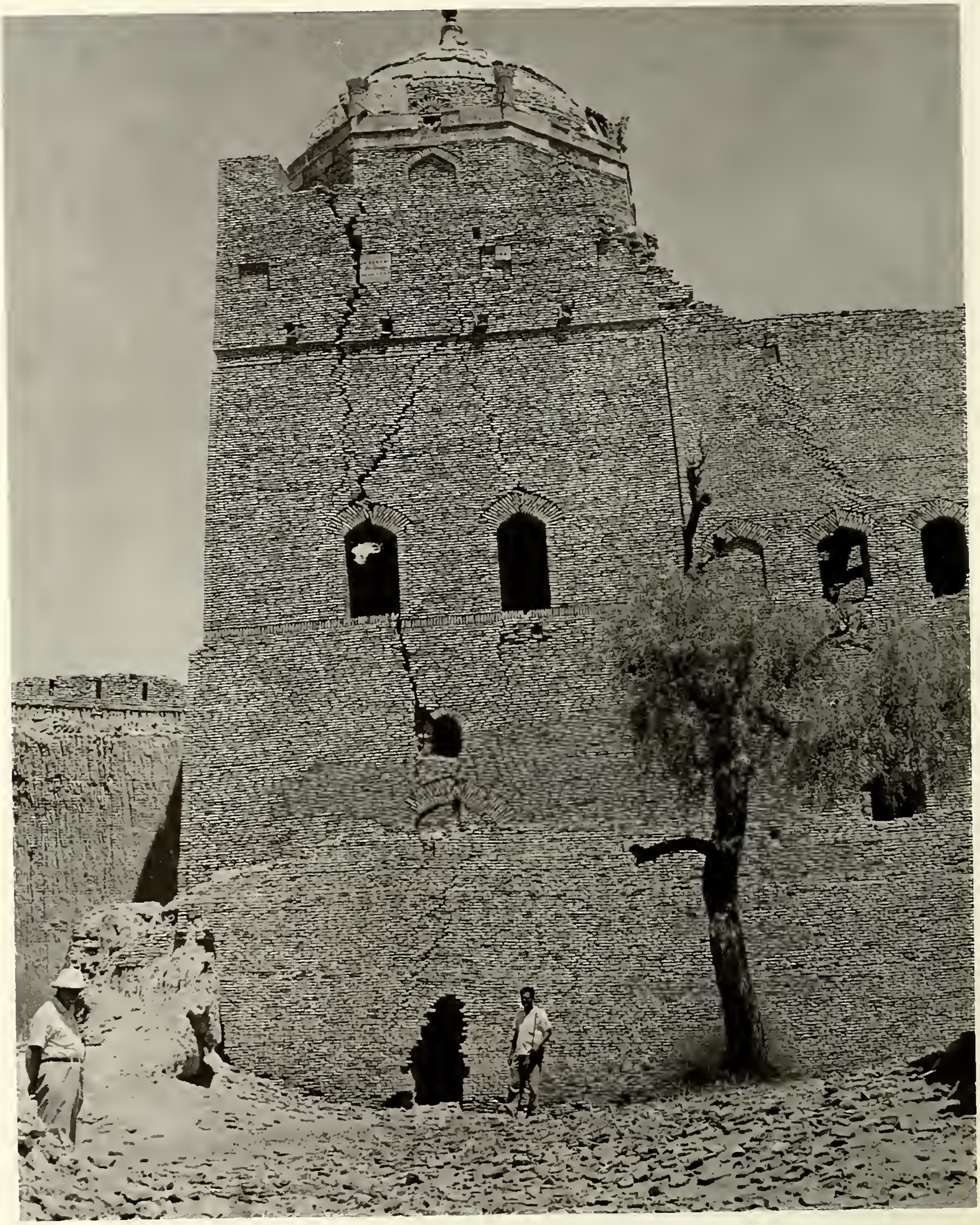
Fort Mojgarh from the east (joins with fig. 72).



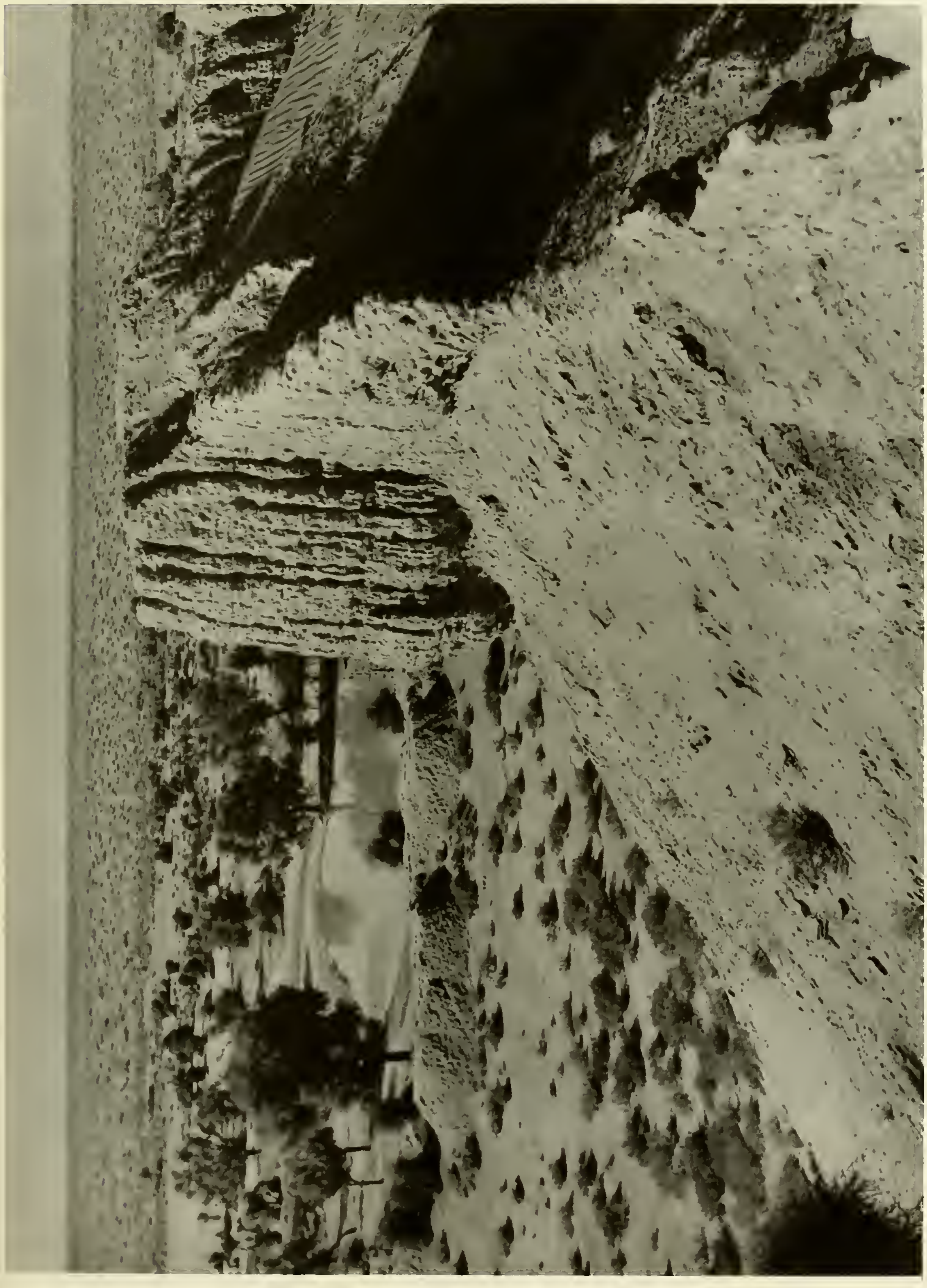
Crumbling walls and courtyard of Fort Mojgarh.



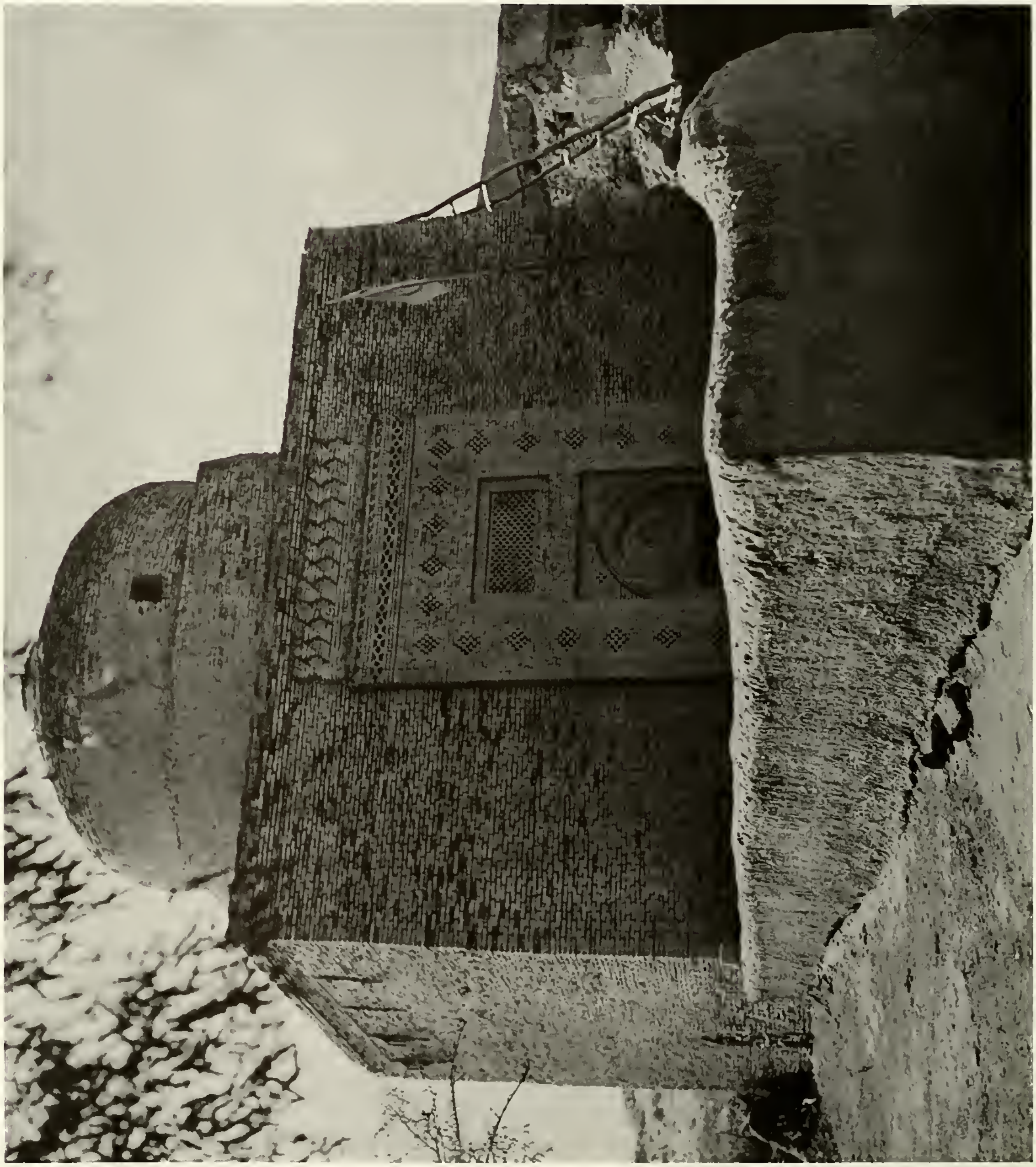
Bastion of interior courtyard, Fort Mojgarh.



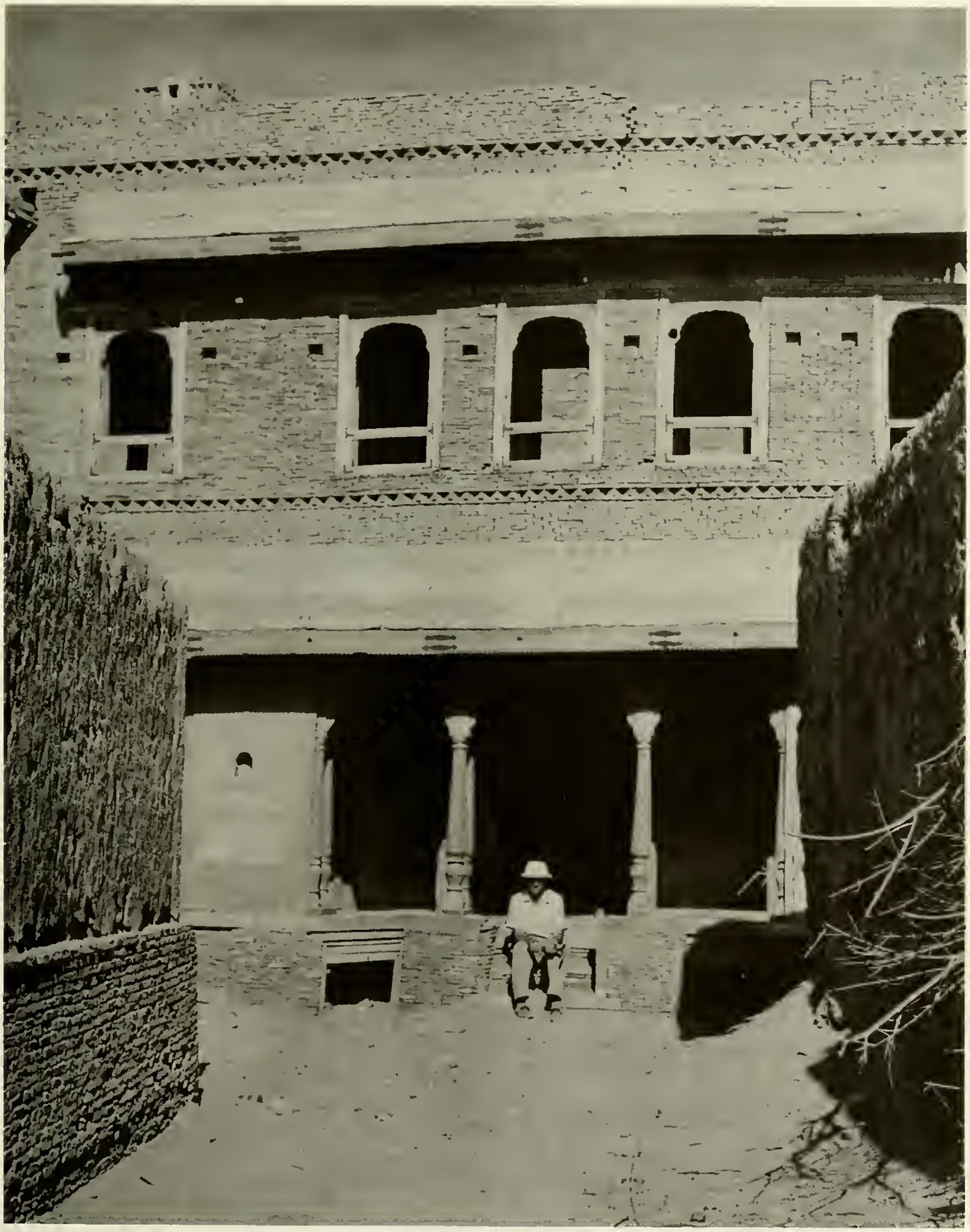
Mosque inside Fort Mojgarh.



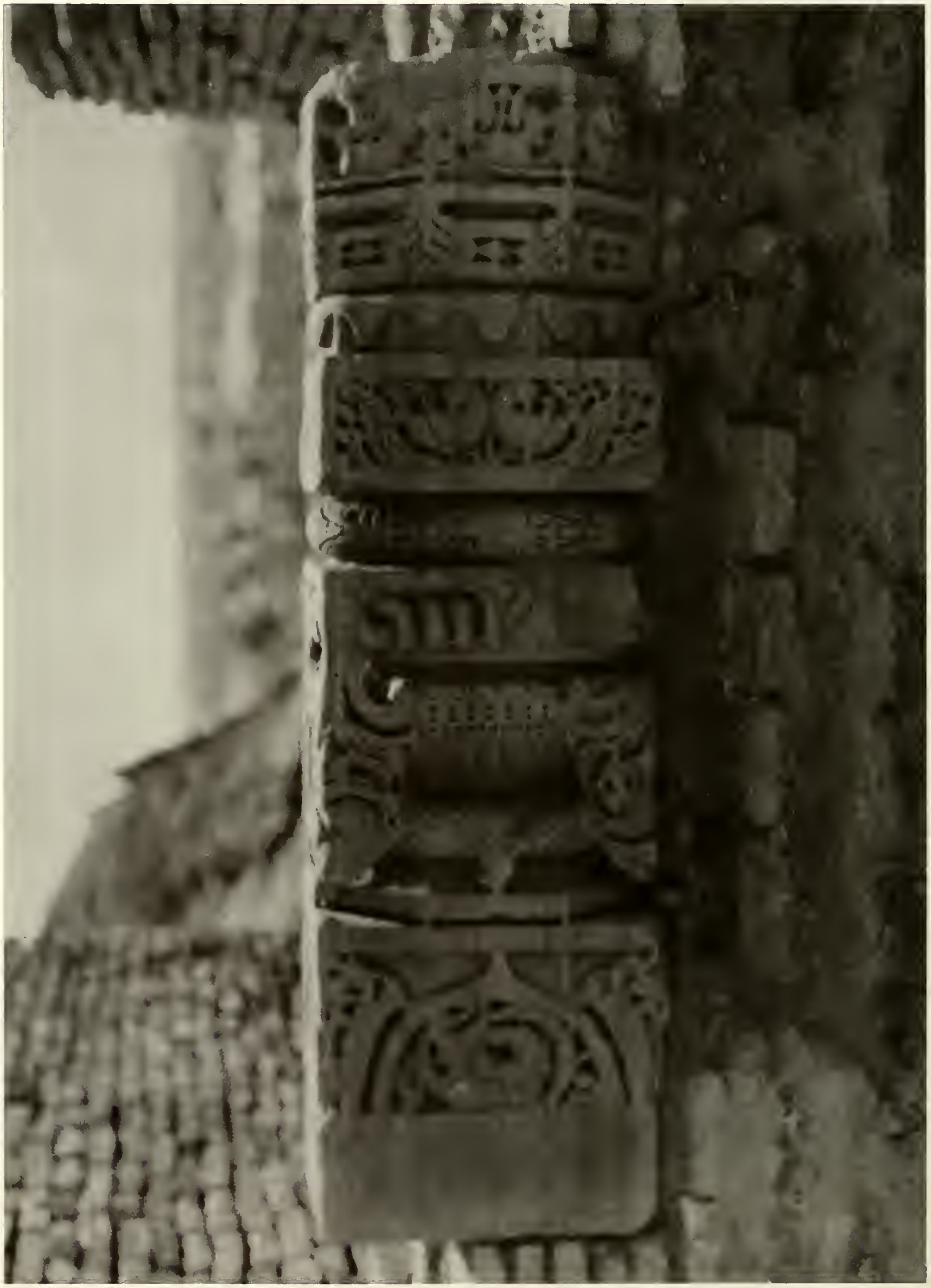
Fort Marot catchment basin and Hagra river bed.



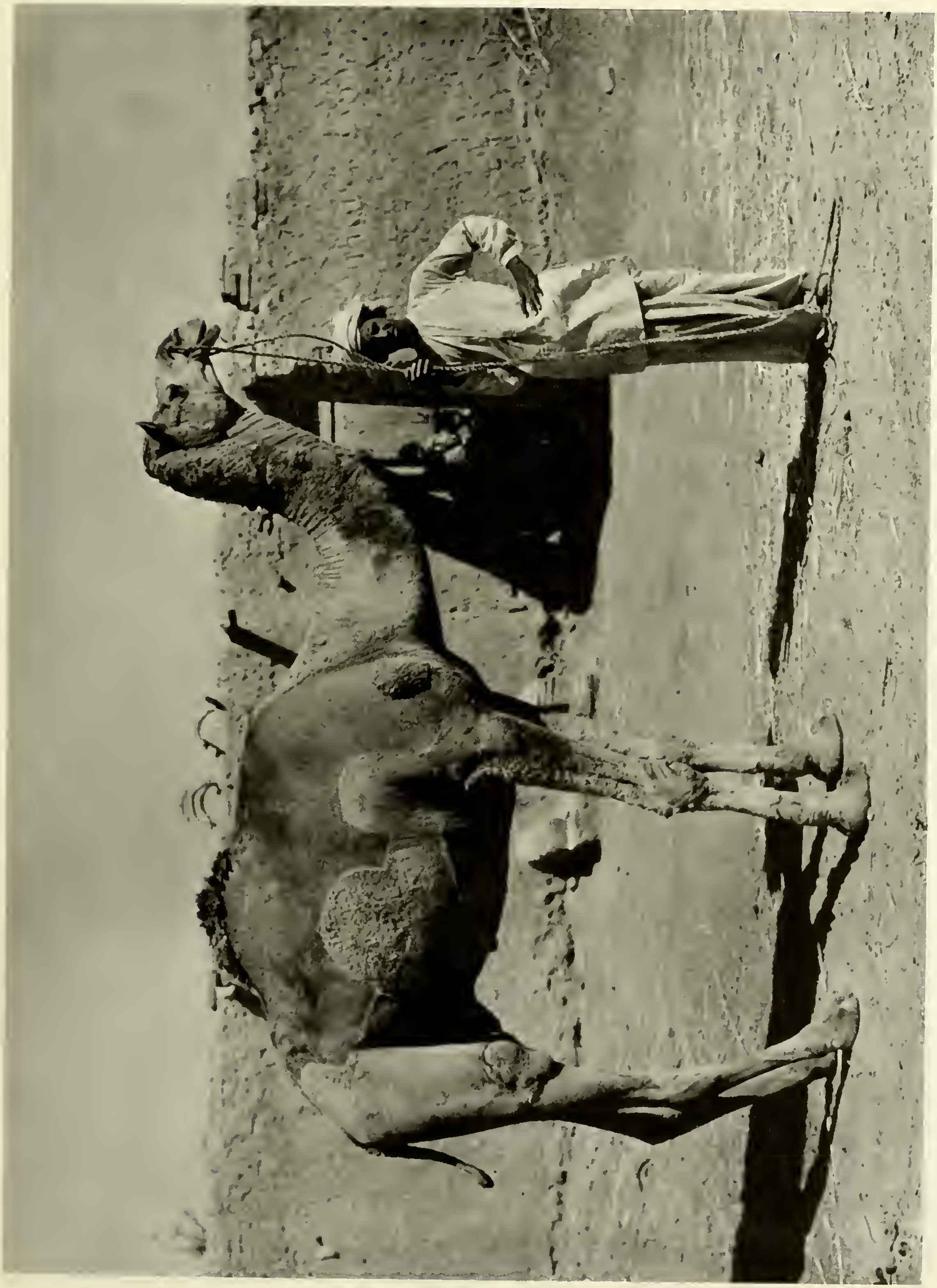
Mosque in Fort Marot.



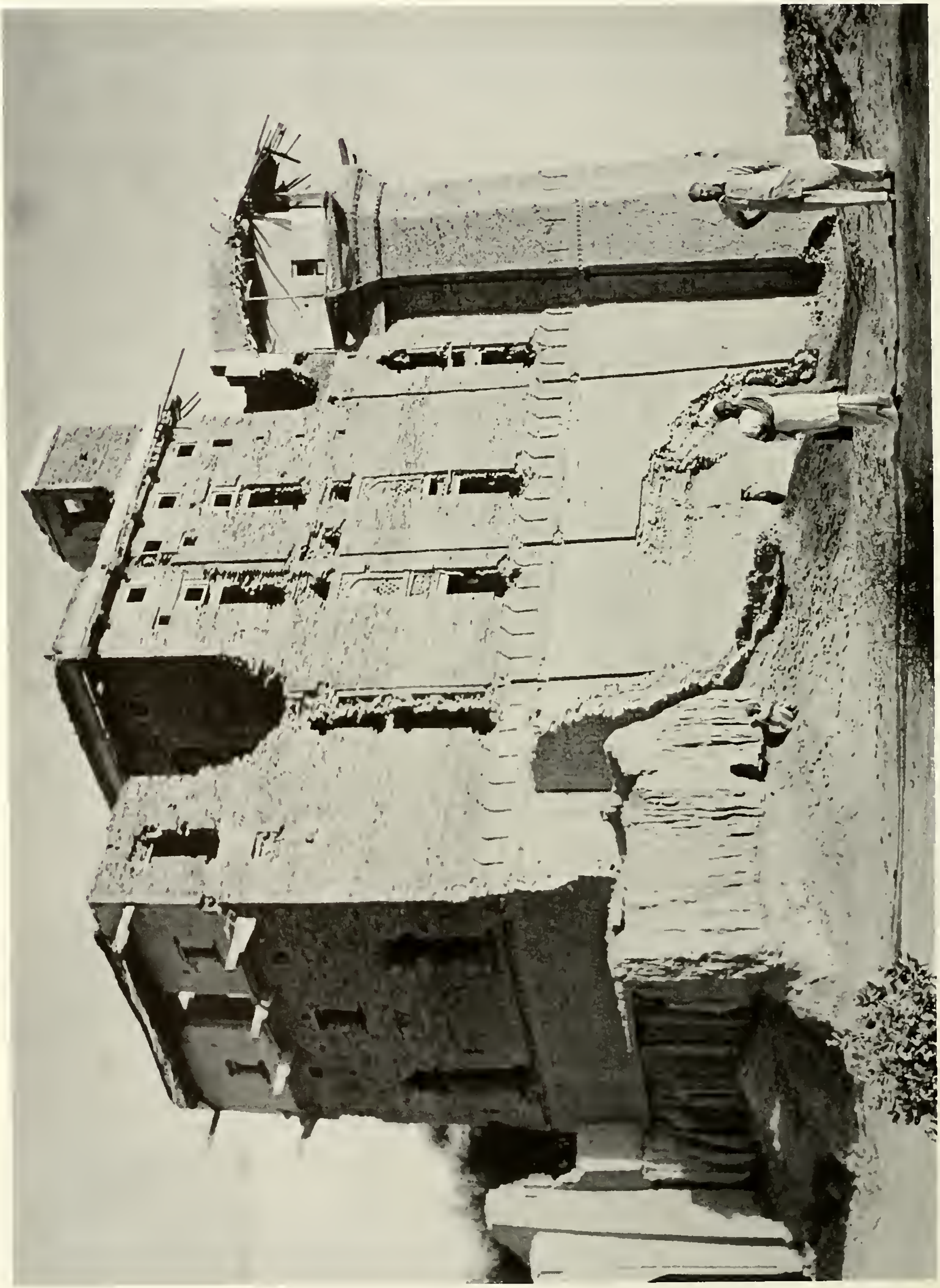
Hindu building in Fort Marot.



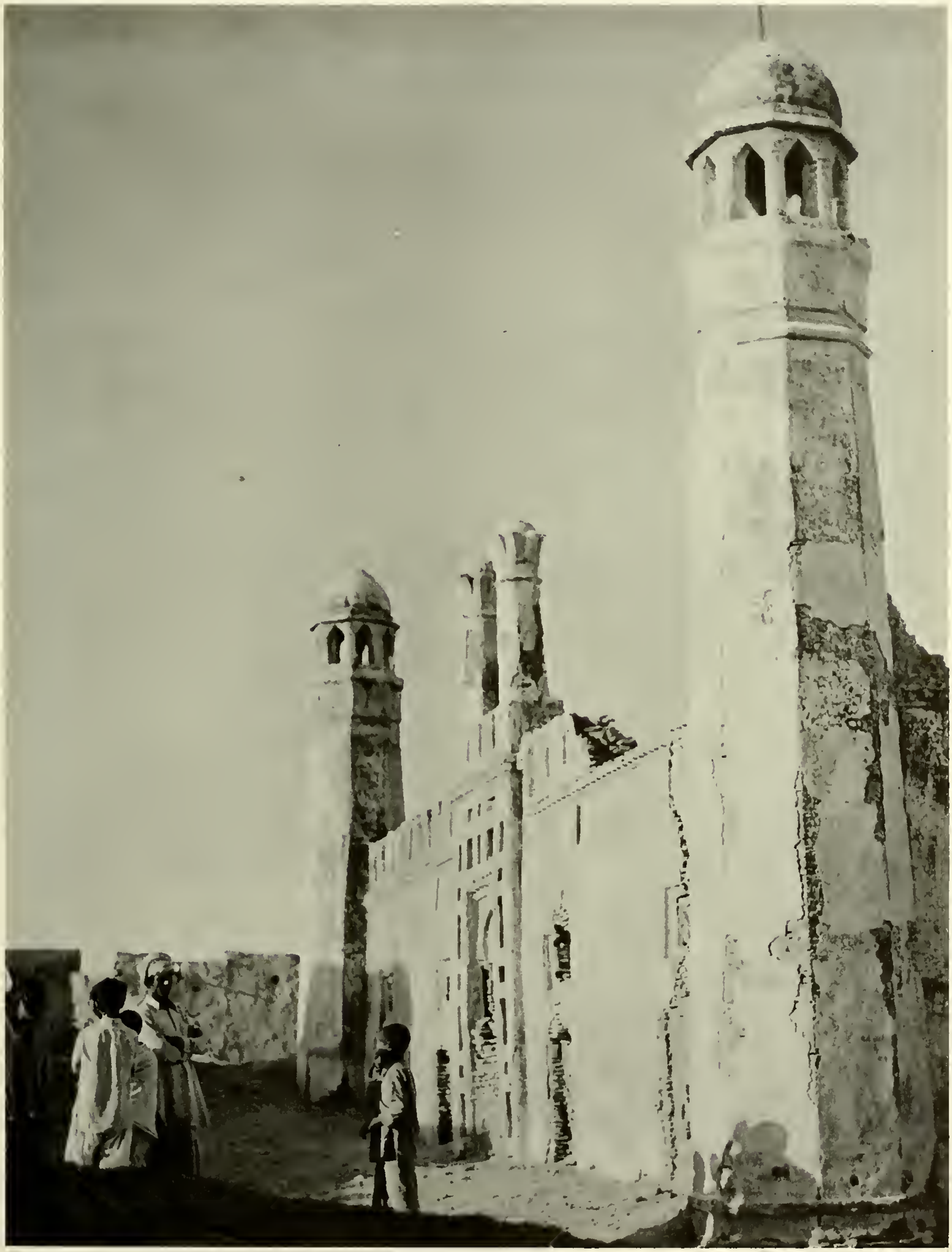
Carved limestone pillar in Fort Marot.



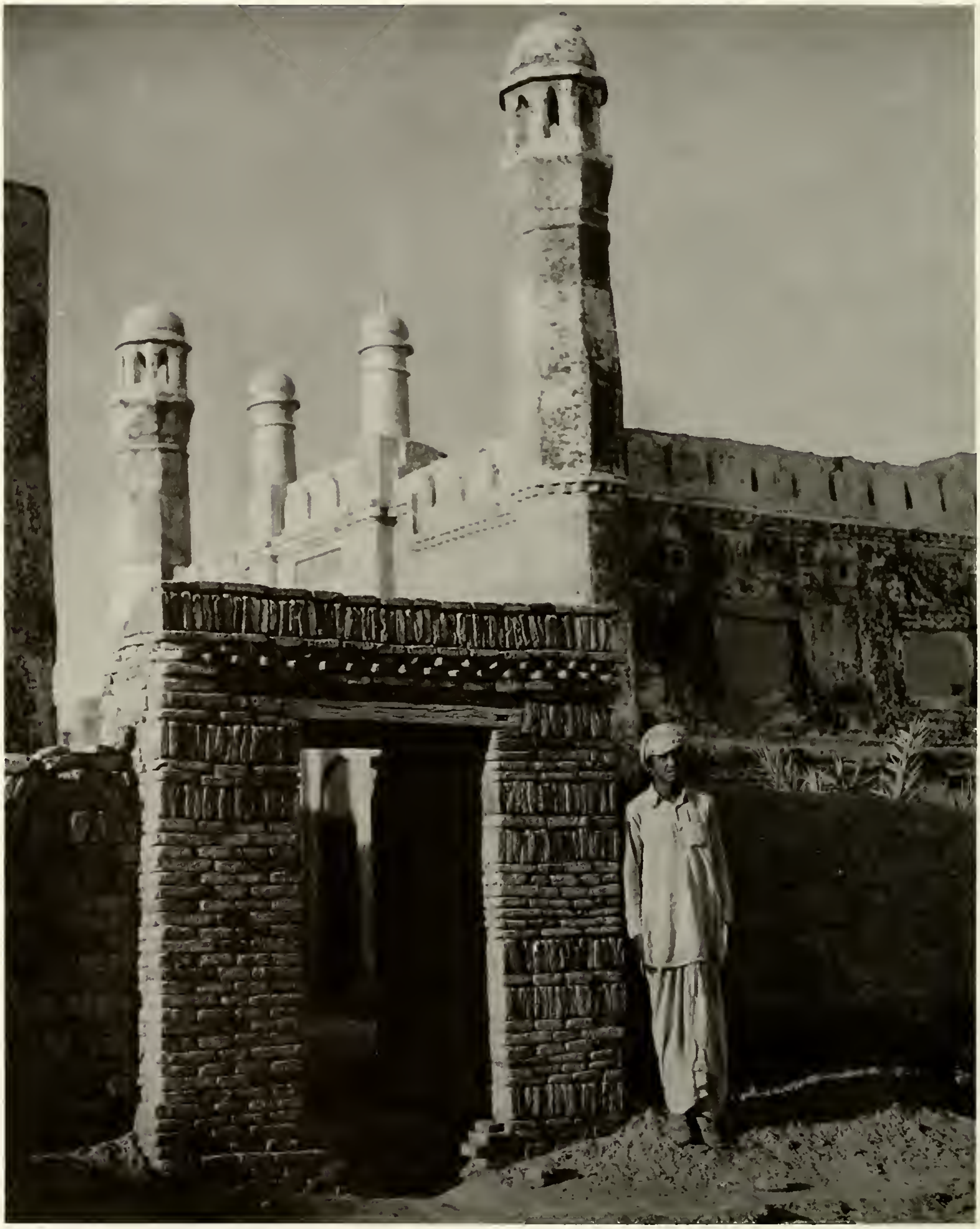
Camel clipped to indicate property of Fort Marot village.



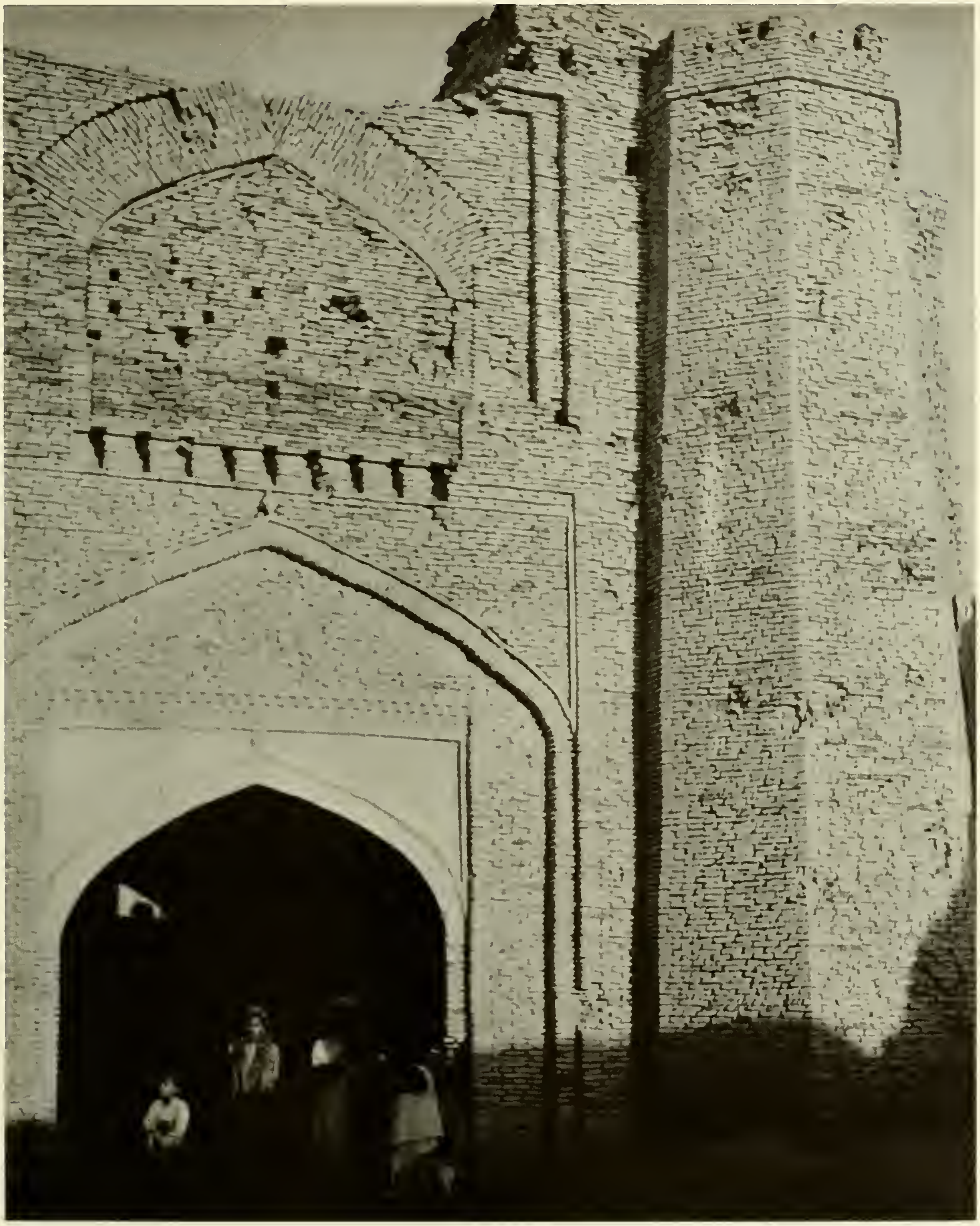
Northeast corner of Fort Abbas.



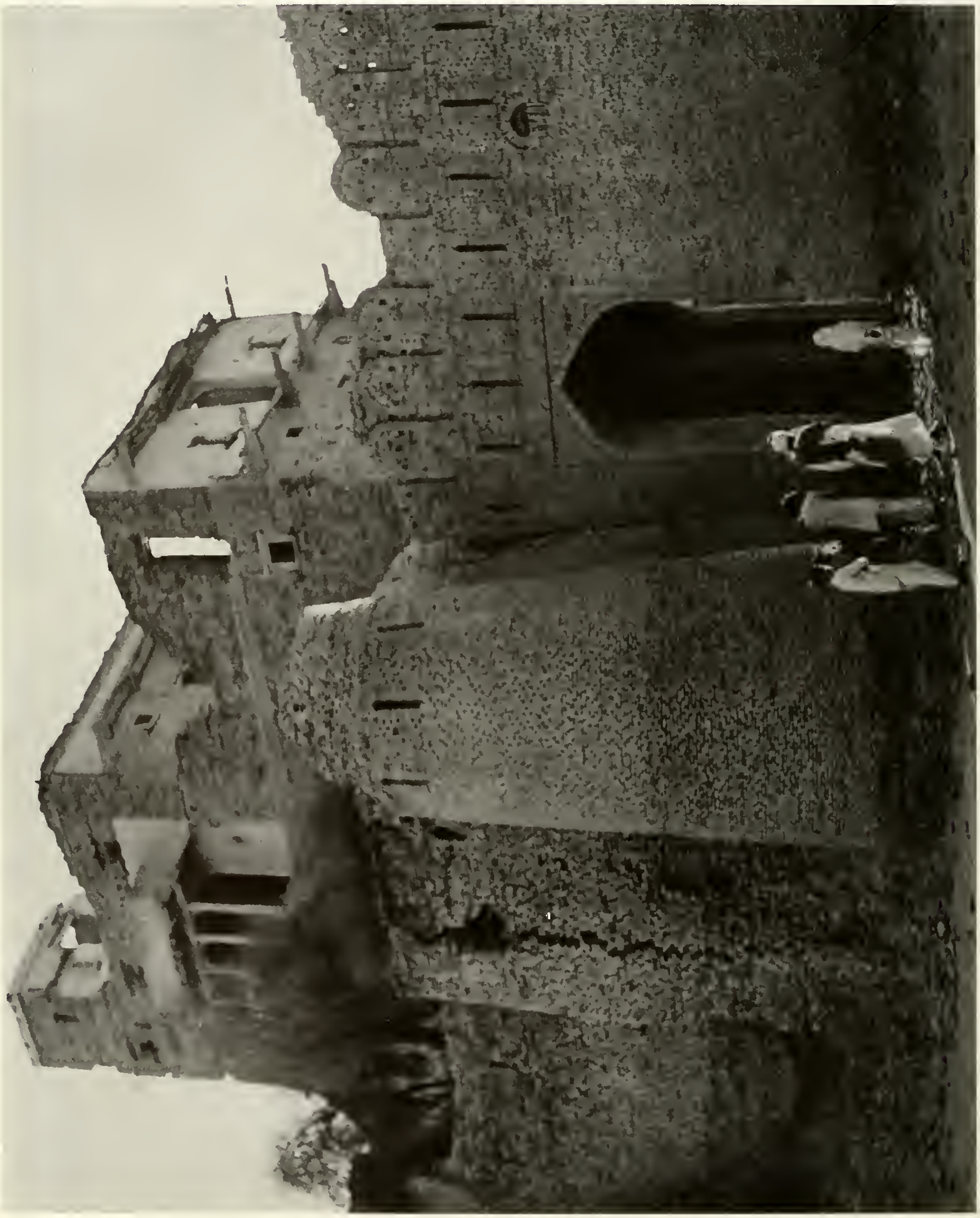
Mosque near Fort Abbas.



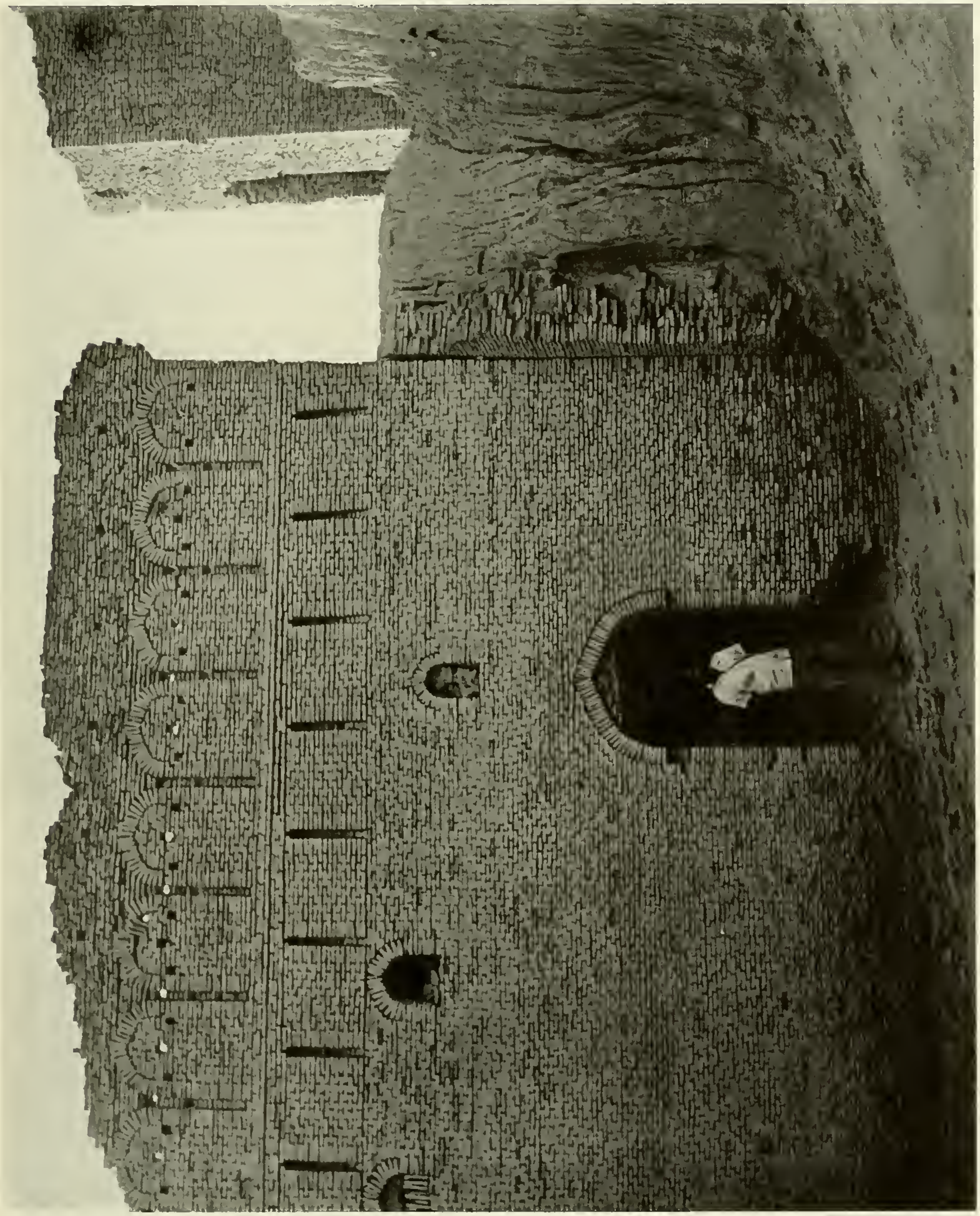
North entrance to mosque near Fort Abbas.



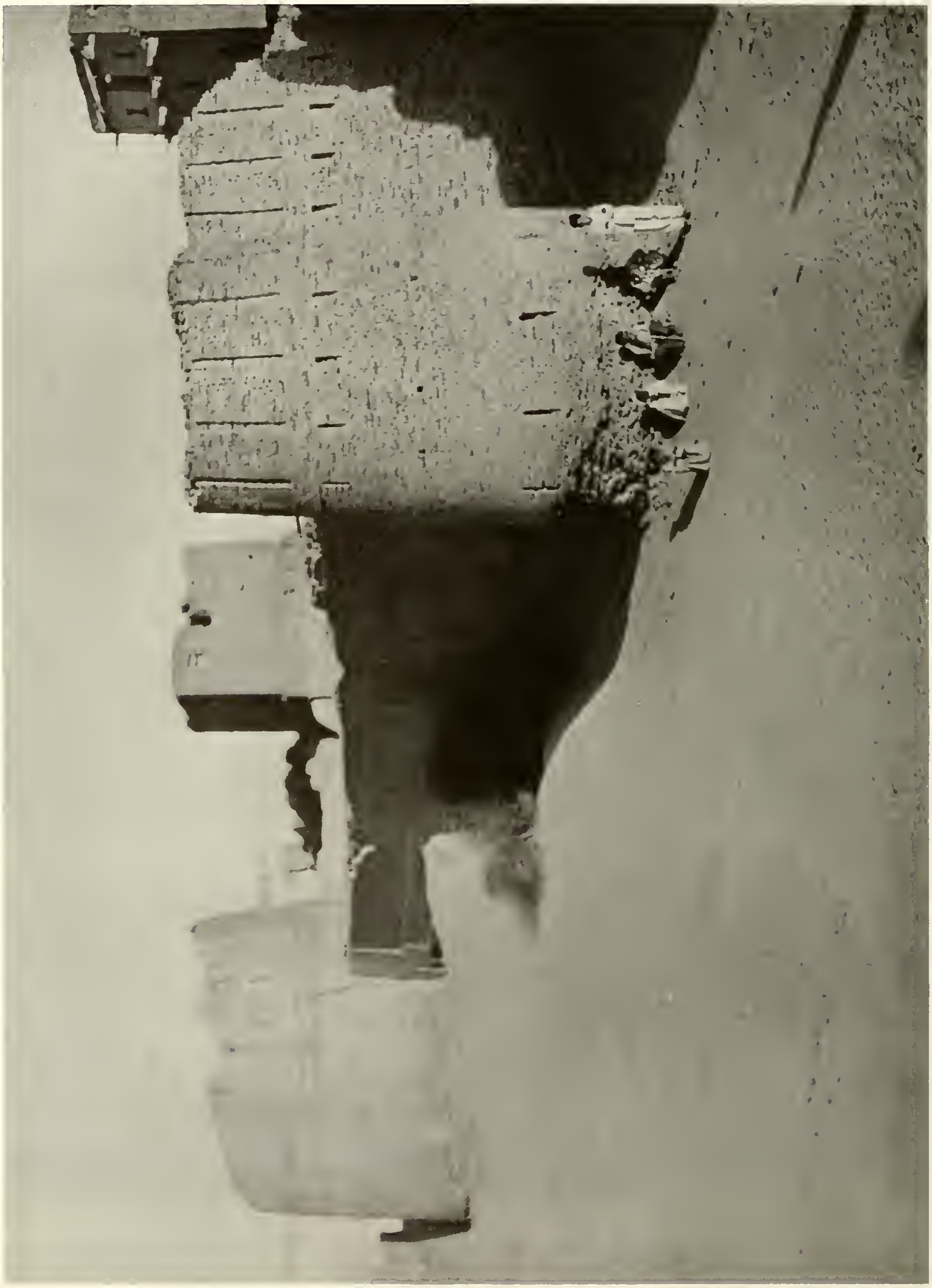
Archway and tower, Fort Abbas.



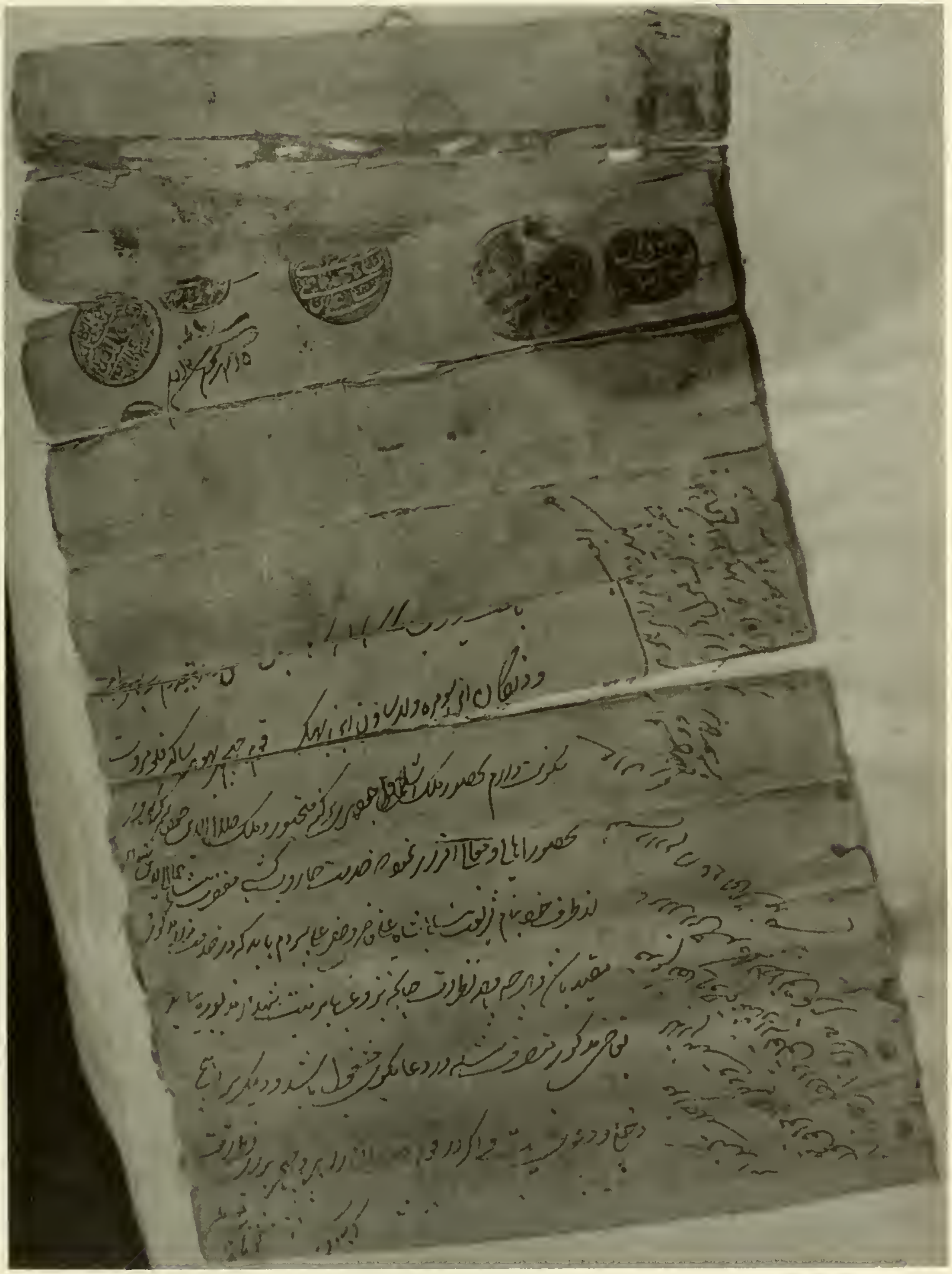
Entrance to Fort Abbas. Note columns in upper left.



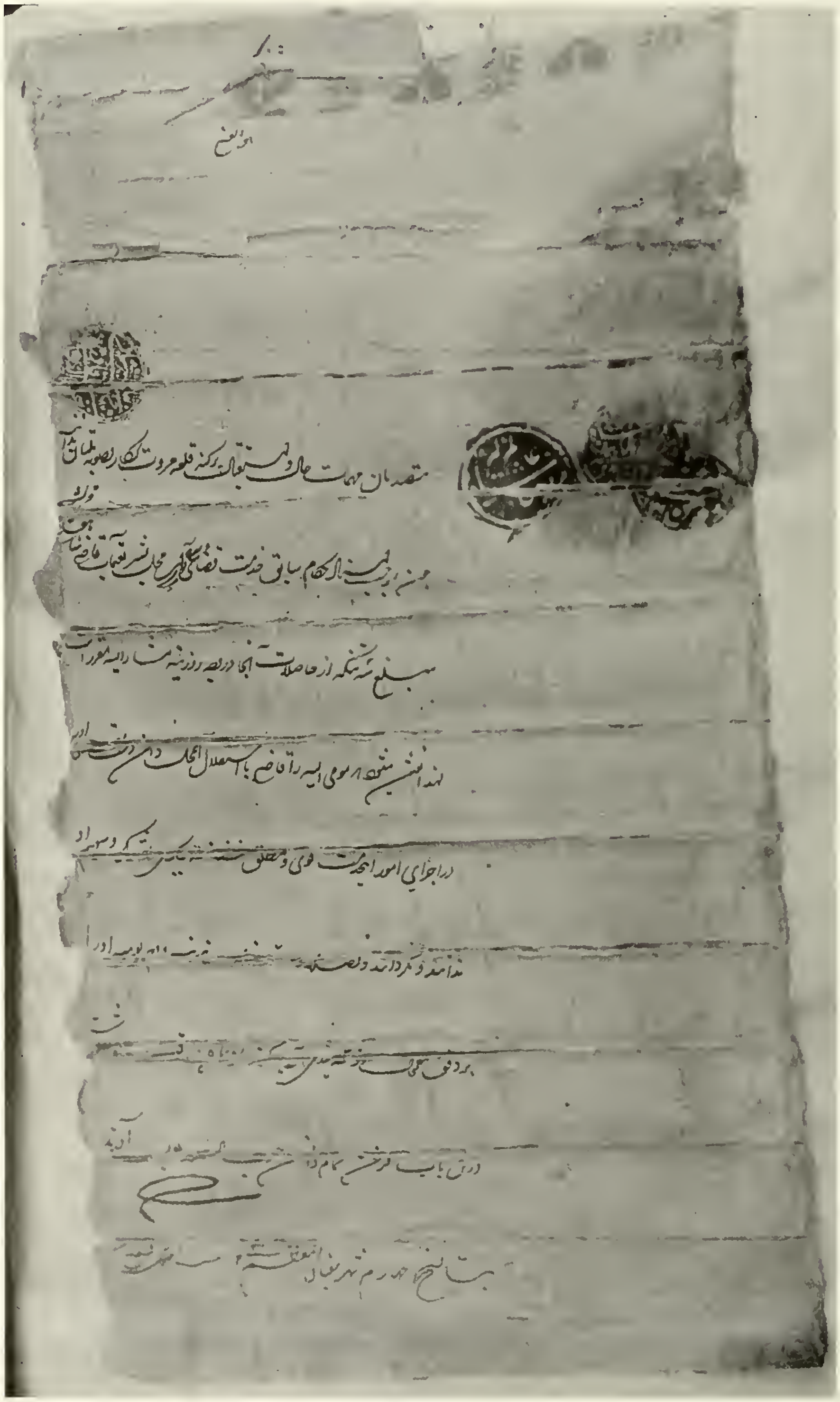
Interior brickwork, Fort Abbas.



Southeast corner, Fort Abbas.



Manuscript A, Fort Marot.



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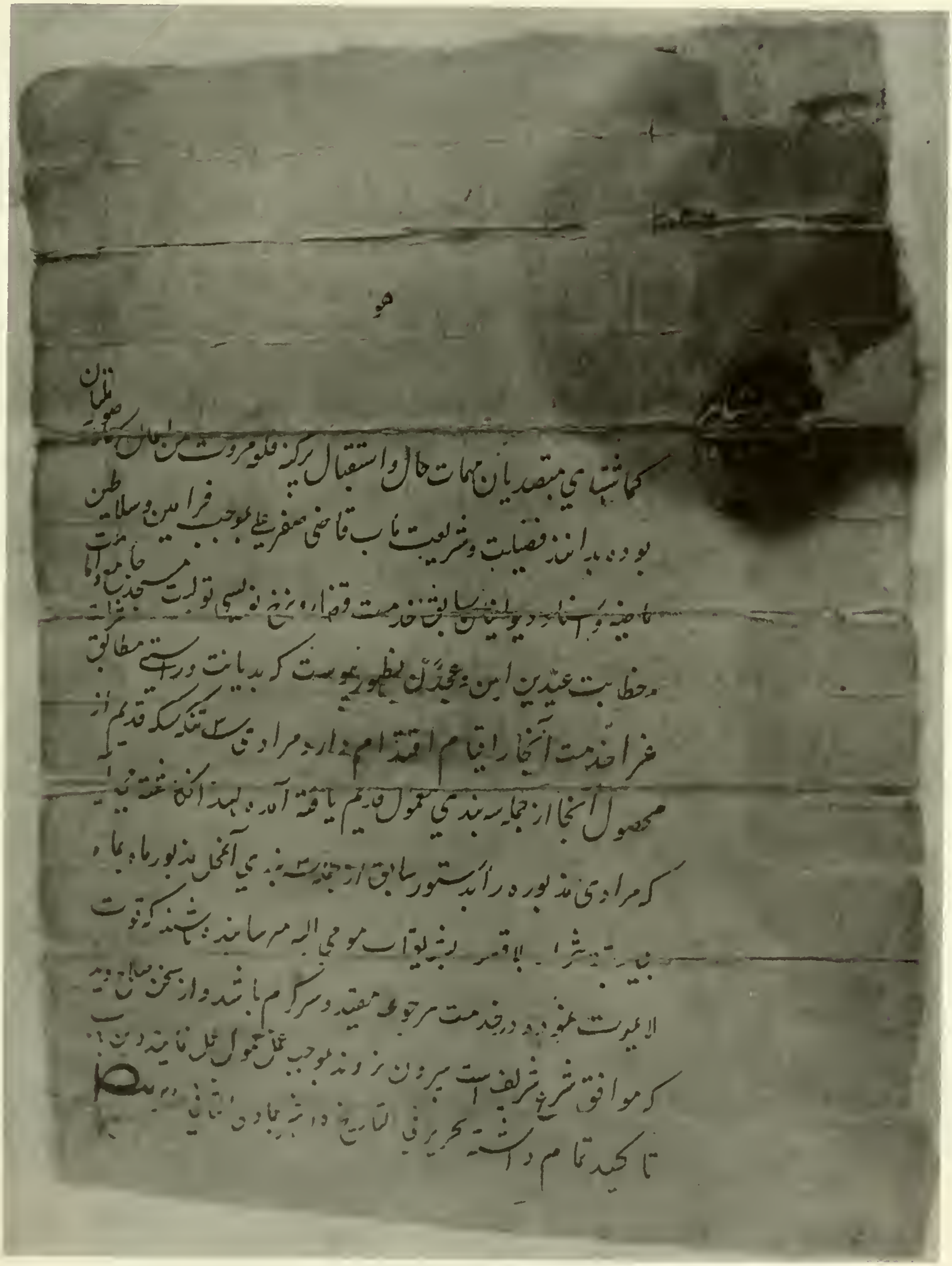


هو

کماشتهای متصدیان مهمات حال و استقبال پرگنه قلعه مروت من اعمال صوبه ملتان

بوده بدانند فضیلت و شریعت مآب قاضی جعفر علی بموجب فرامین سلاطین

ماضیه و اسناد دیوانیان سابق خدمت قضا و نرخ نویسی و تولیت مسجد جامع و امامت [illegible]

و خطابت عیدین این قصبه متعلق بوده است که بدیانت و راستی مطابق

شرع خدمت آنجا را بتمام اقدام دارد و مرادی سی تنکه سکه قدیم از

محصول آنجا از جمله بندی معمول قدیم یافته آمده لهذا اکنون نیز

که مرادی مذکوره را بدستور سابق از جمله بندی آنمحل مذکور ماه بماه

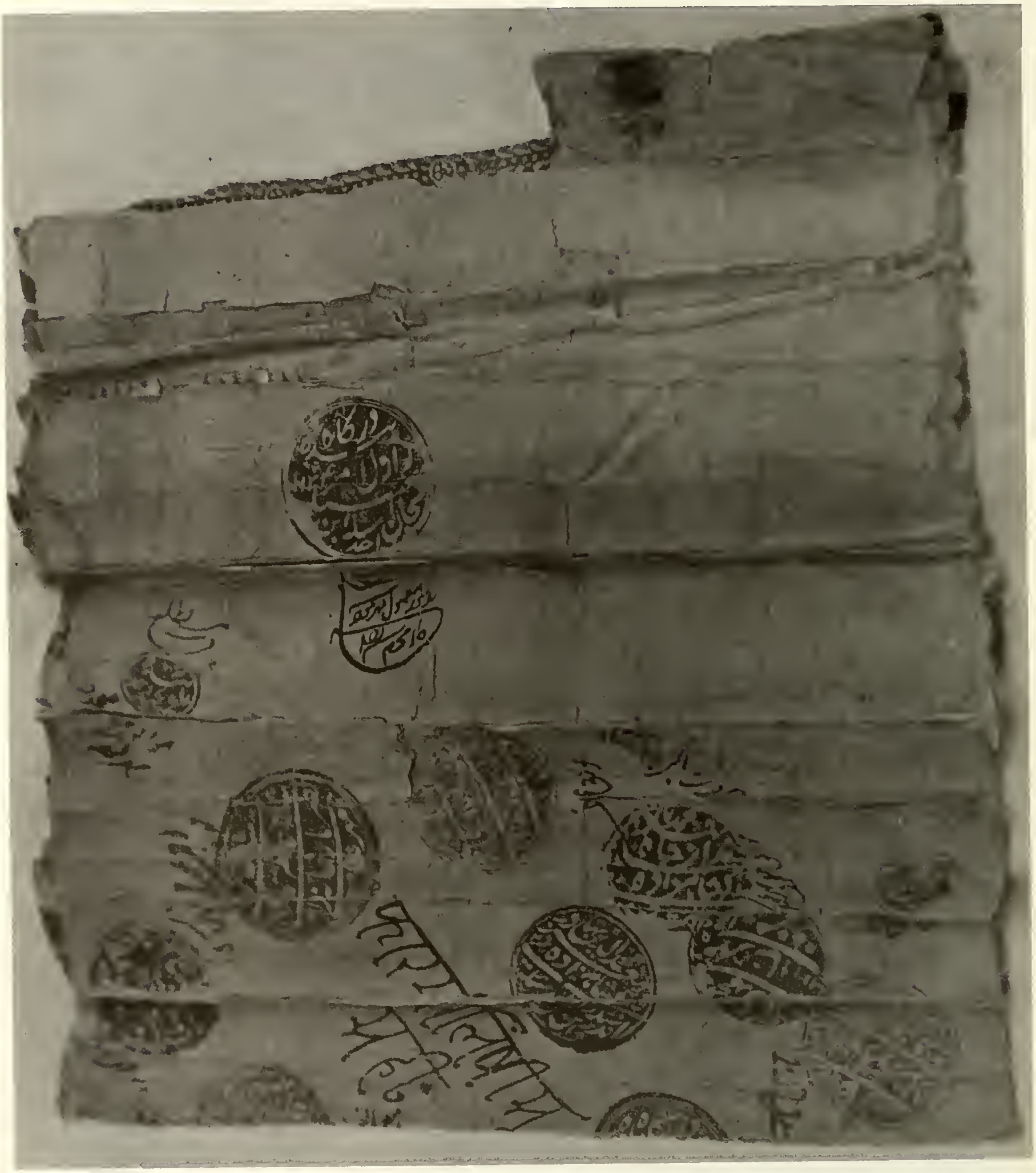
[illegible] مواجب الیه میرسانیده باشند که بقوت

لایموت خود در خدمت مرجوعه مقید و سرگرم باشد و از سخن صلاح دید

که موافق شرع شریف است بیرون نروند موجب عمل معمول [illegible] نمایند درین باب

تاکید تمام دانسته تحریر فی التاریخ [illegible]

Manuscript C, Fort Marot.



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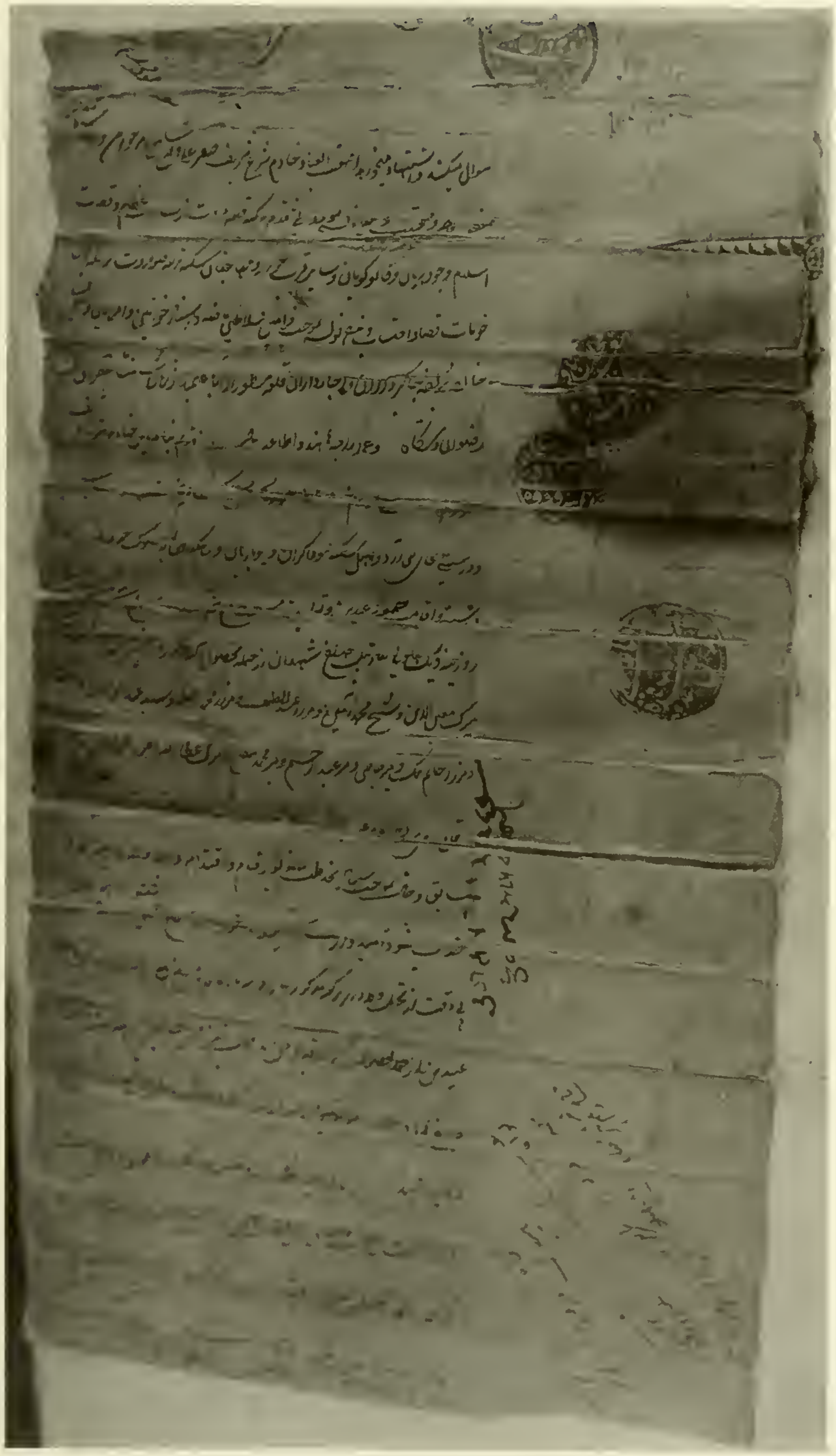

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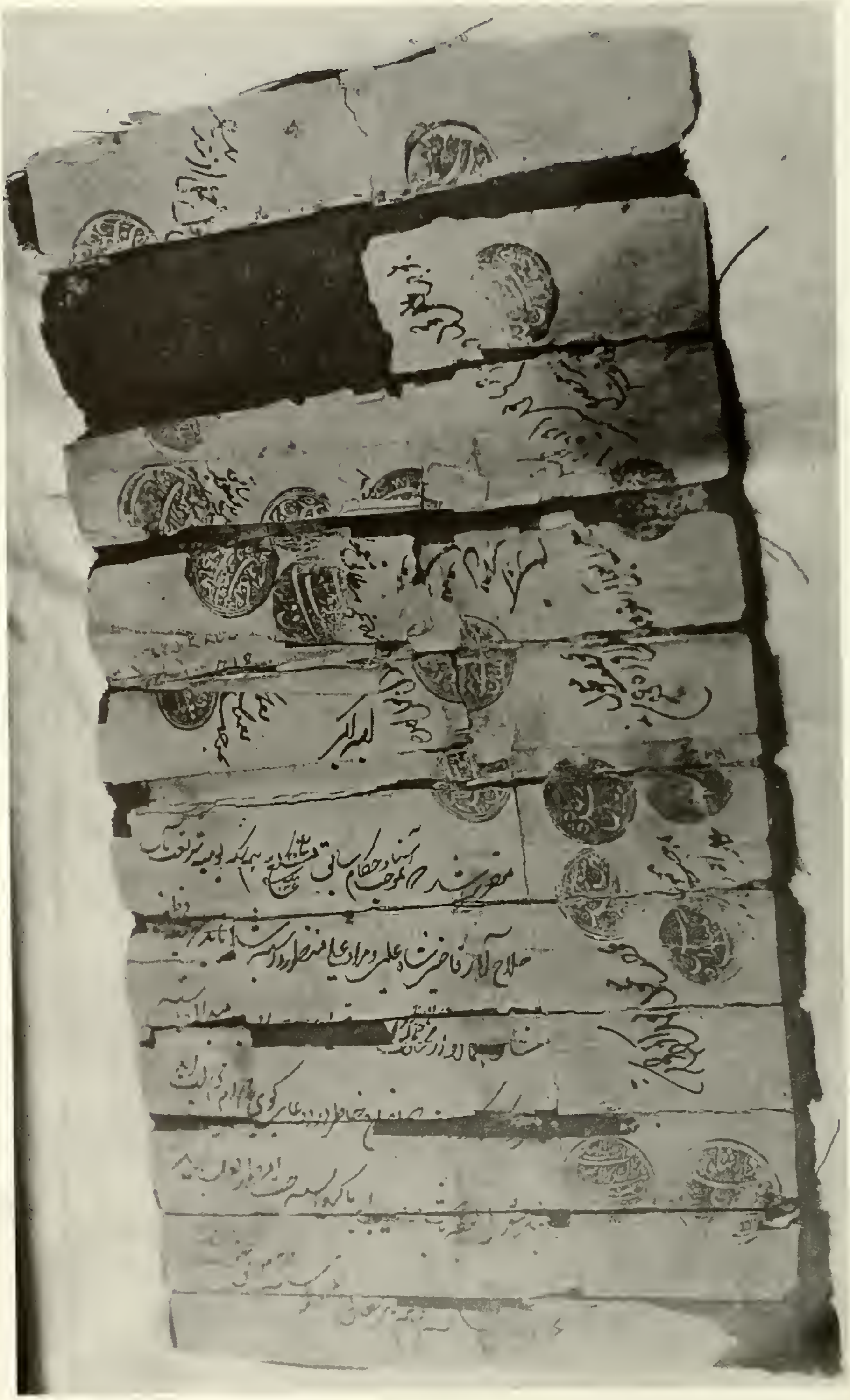

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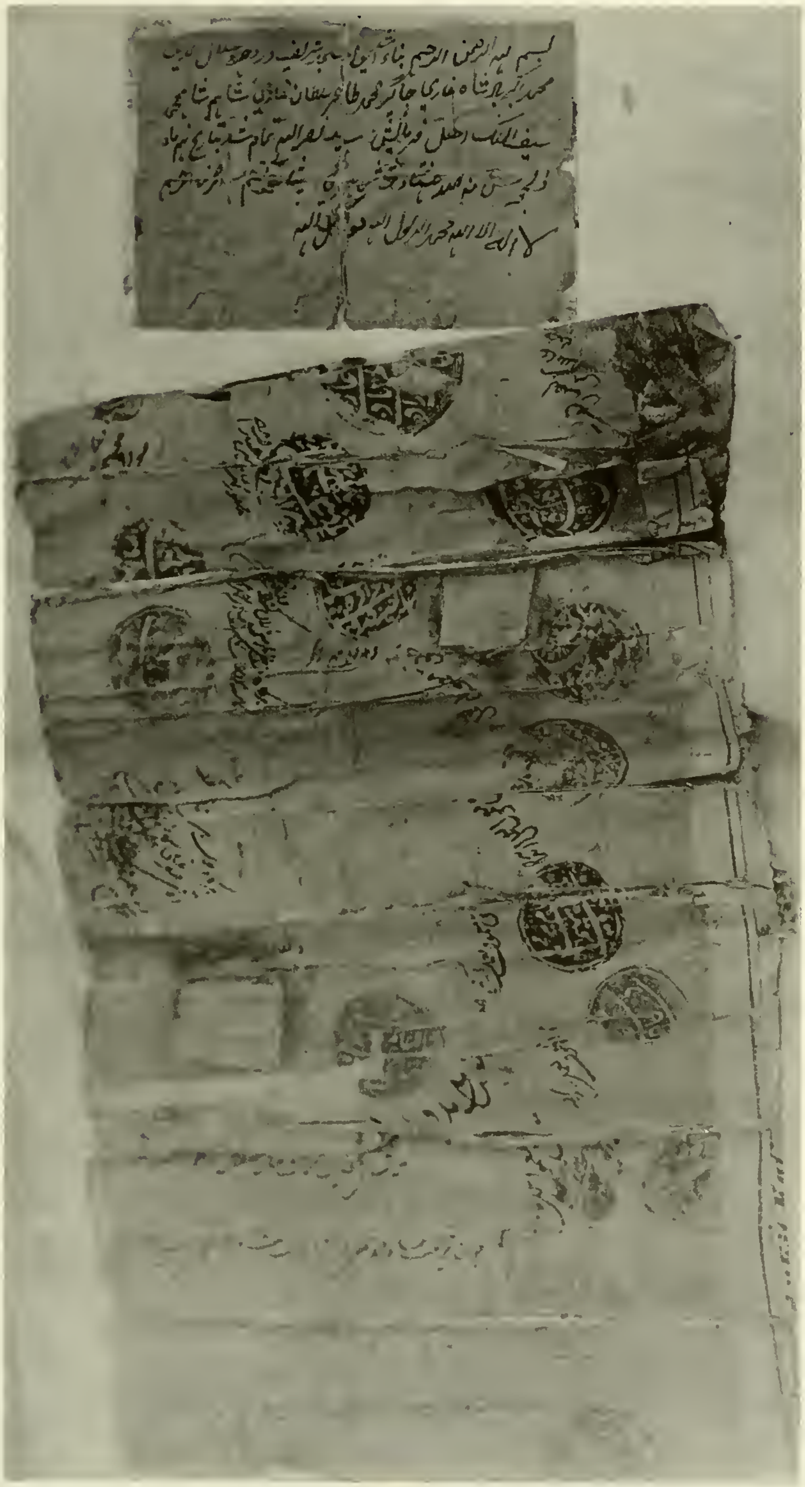

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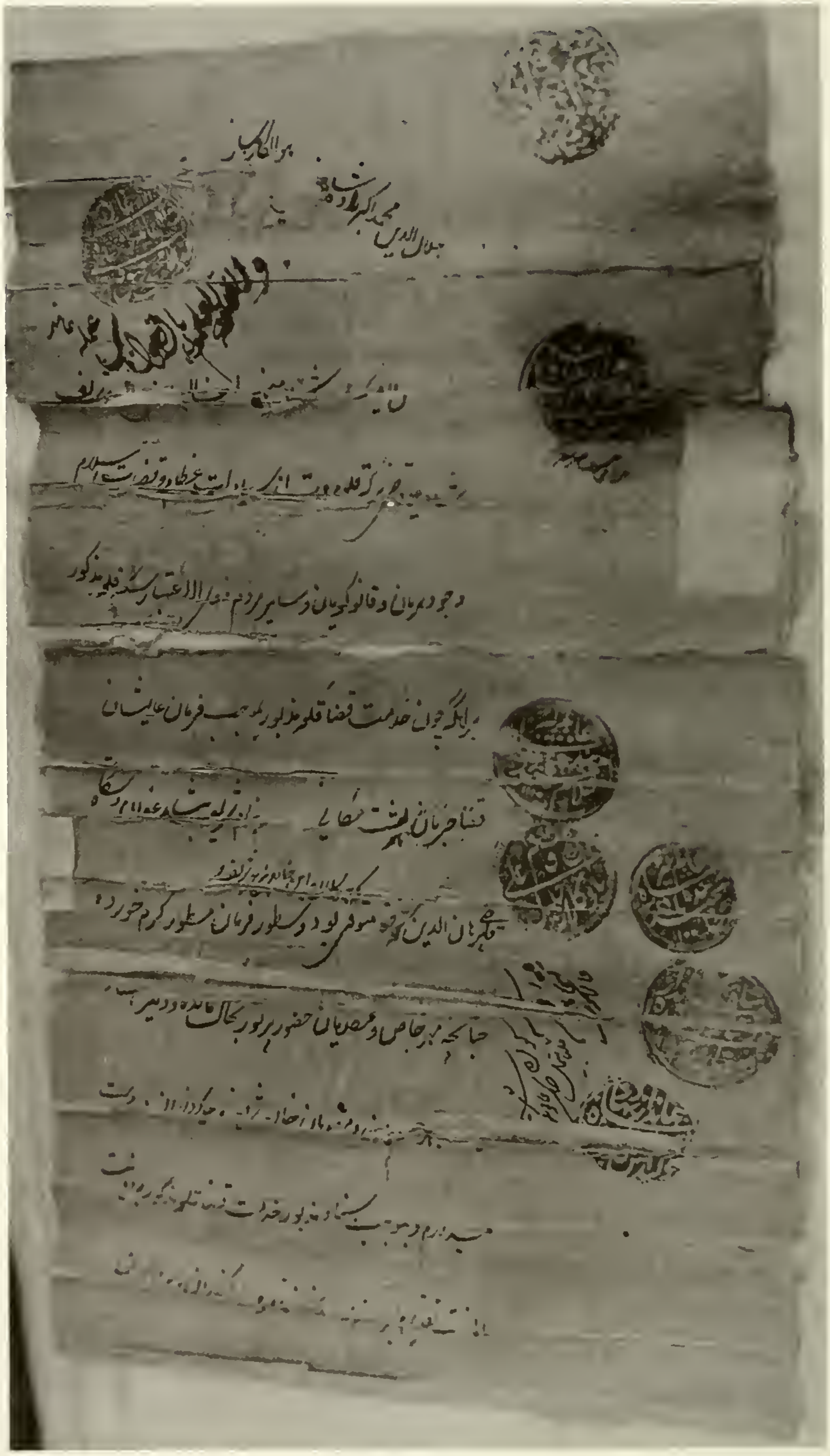

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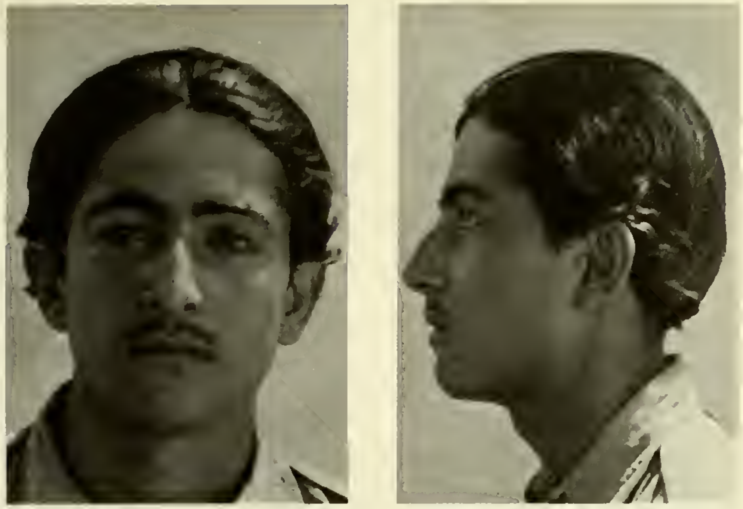

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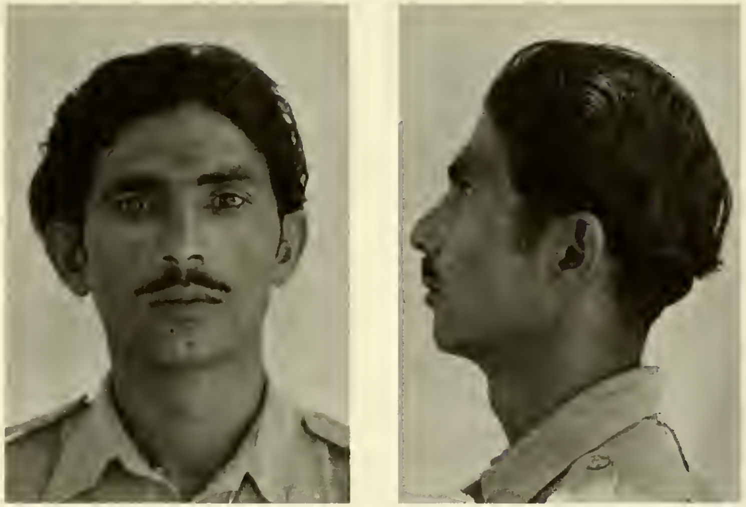

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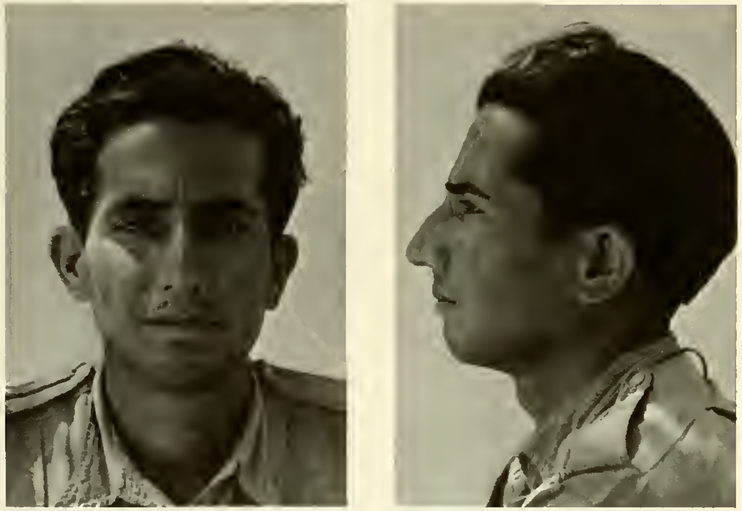

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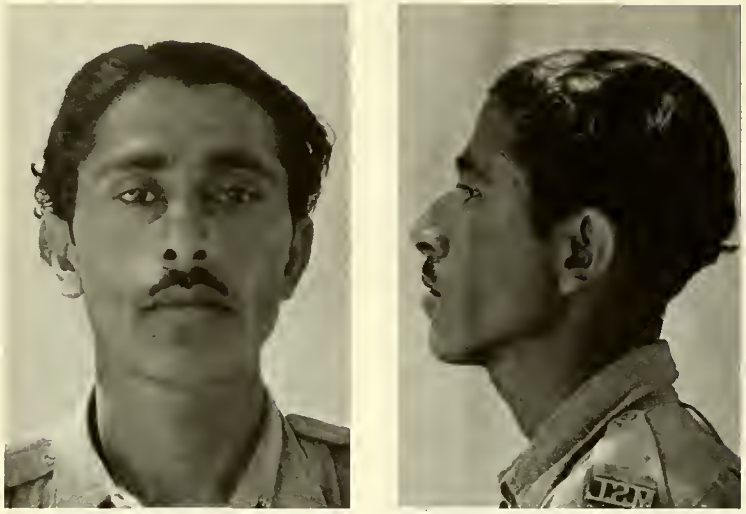
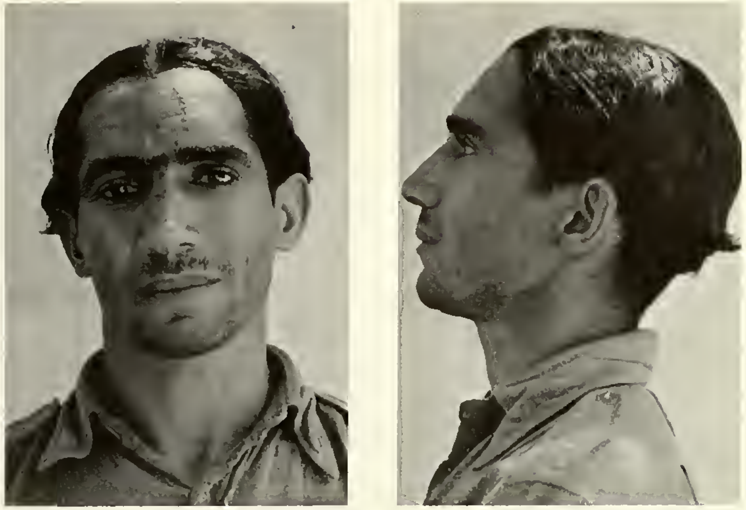


No. 25 (Age 24)

Baluchis at Turbat.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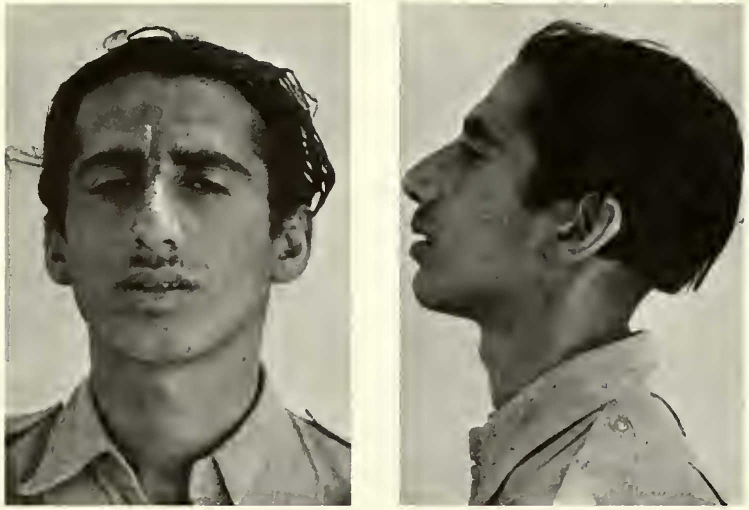
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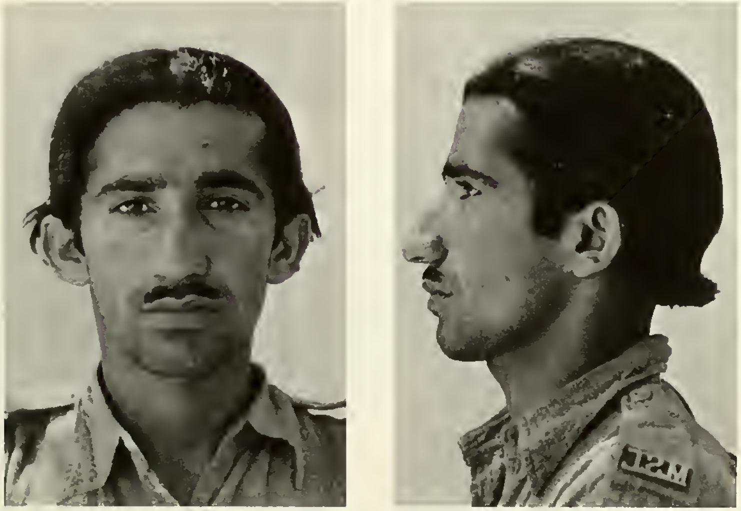
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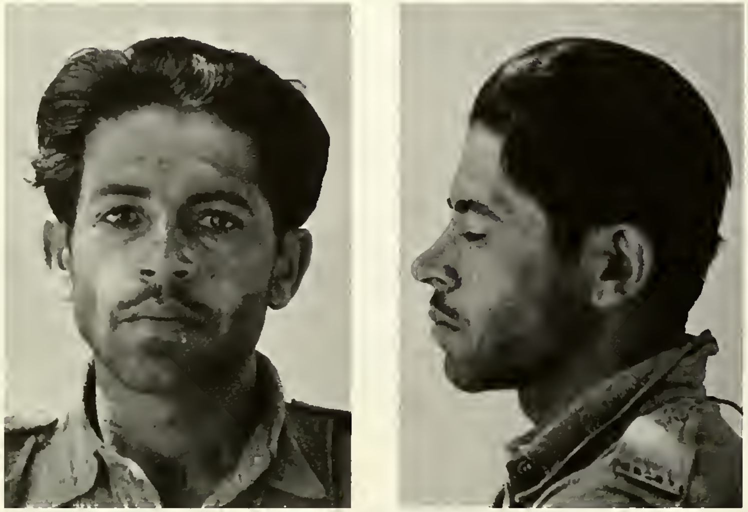
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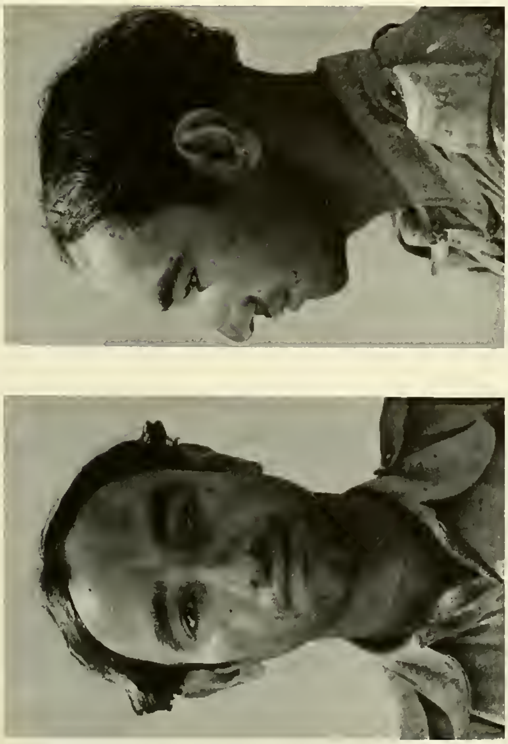
Baluchis at Turbat.



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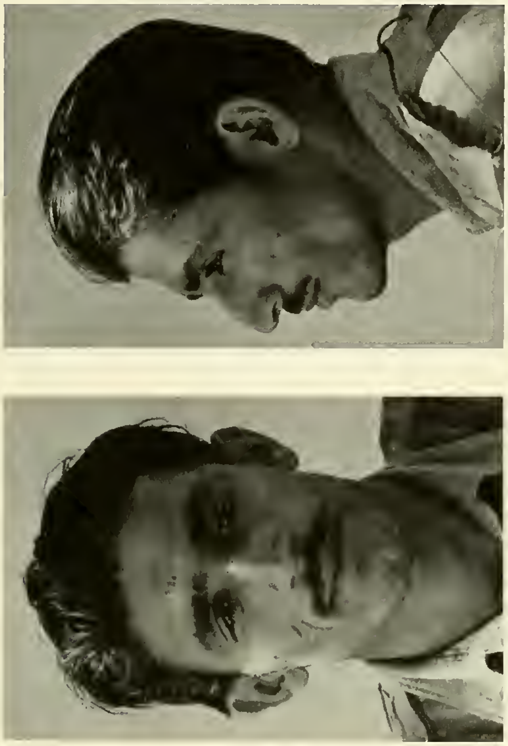

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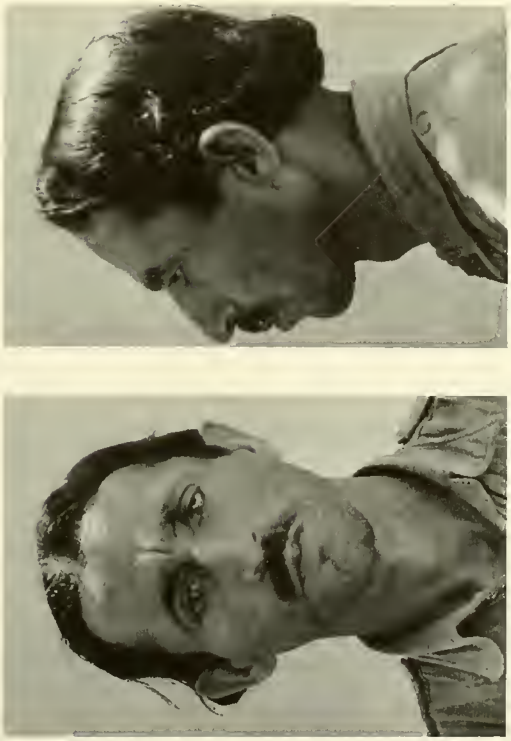

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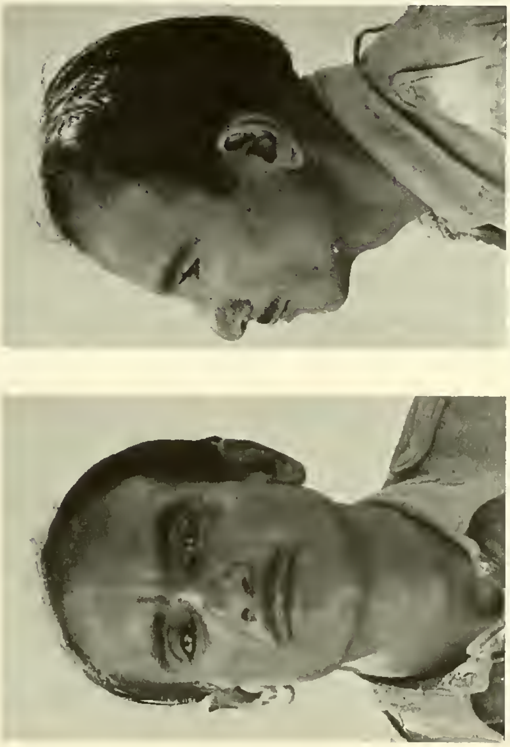
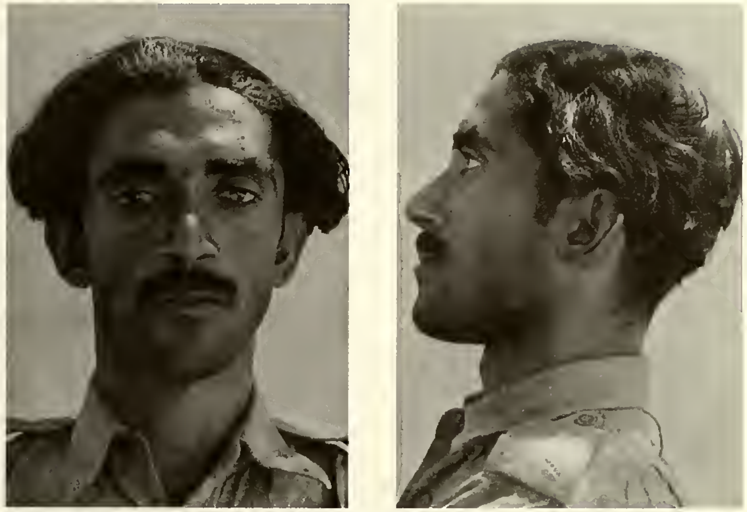


No. 23 (Age 30)

Baluchis at Turbat.



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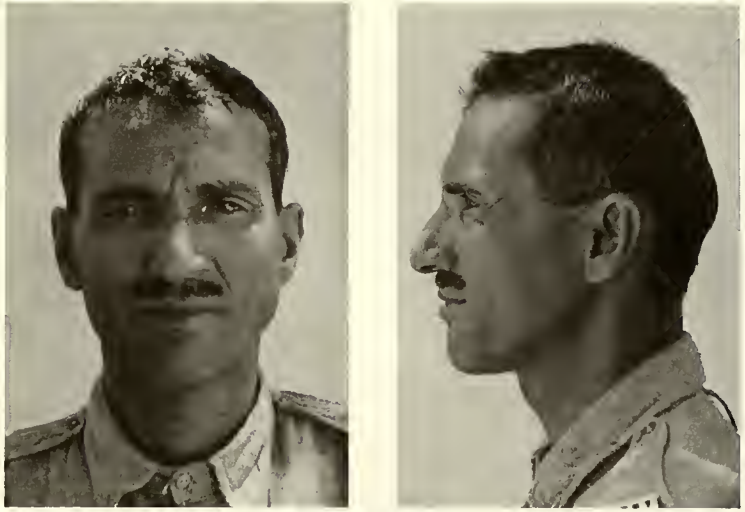

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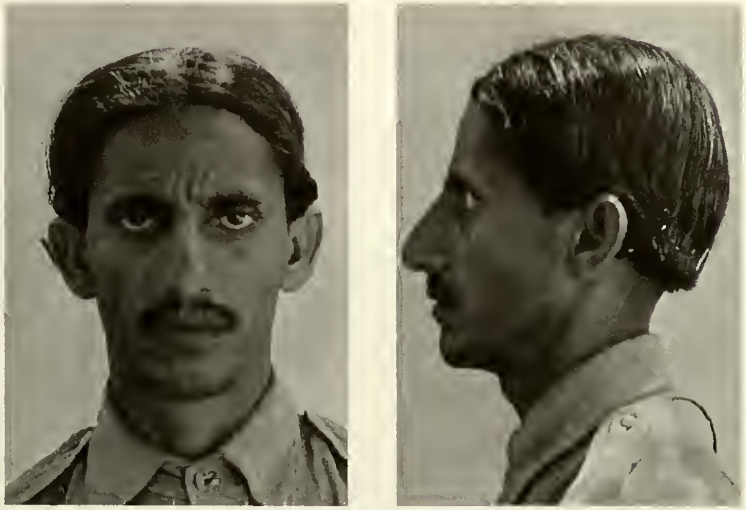

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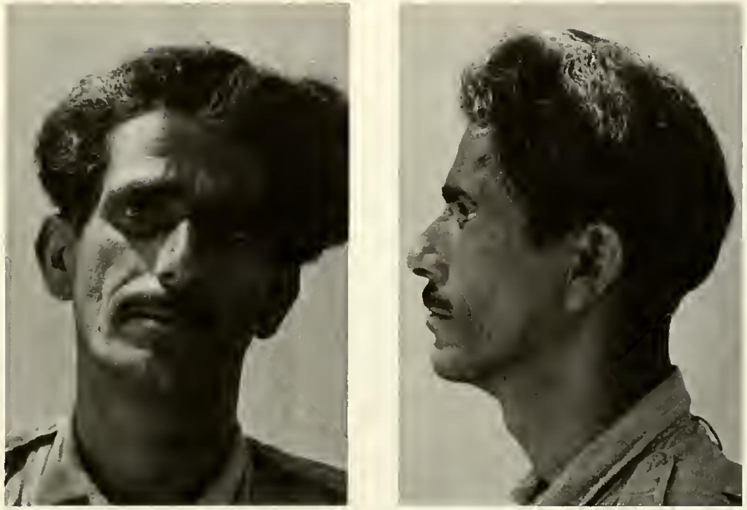
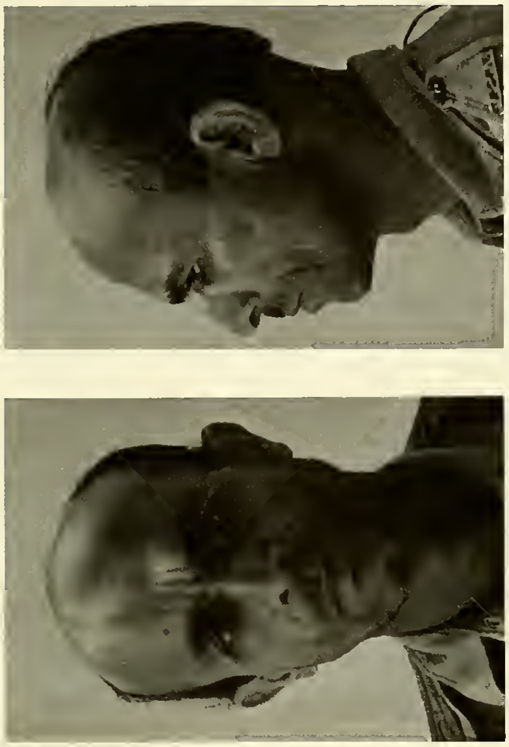


No. 24 (Age 35)

Baluchis at Turbat.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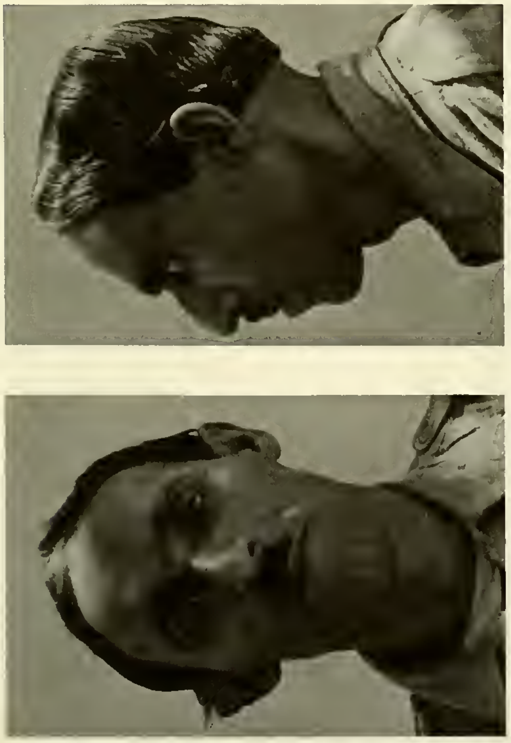
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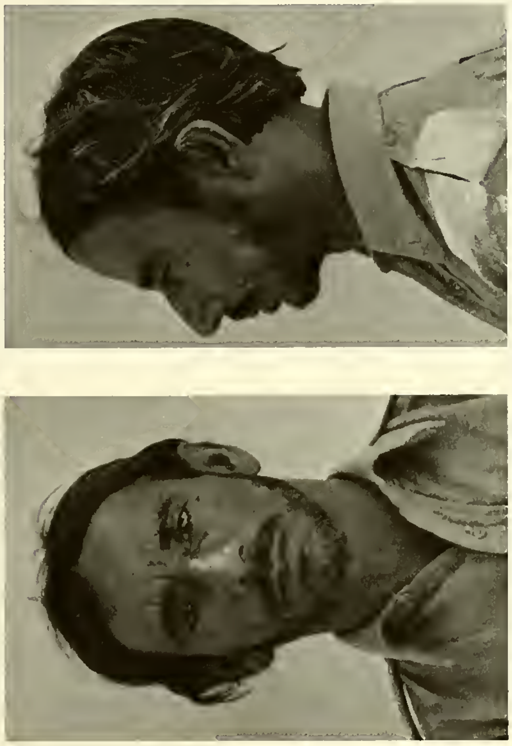
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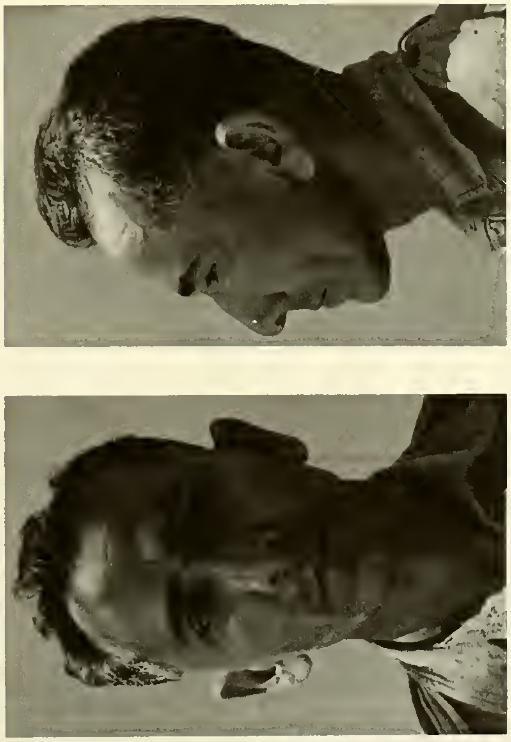
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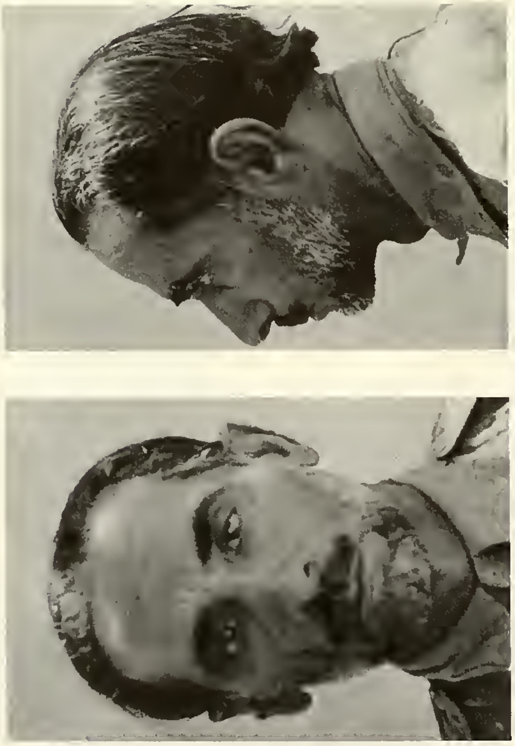
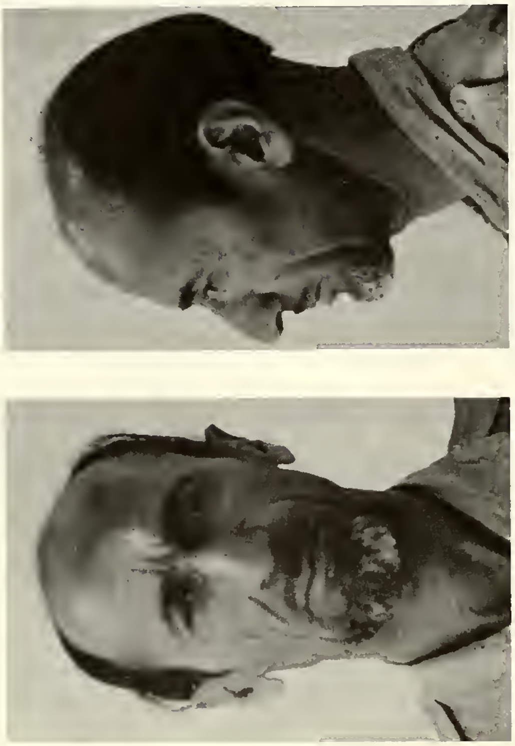
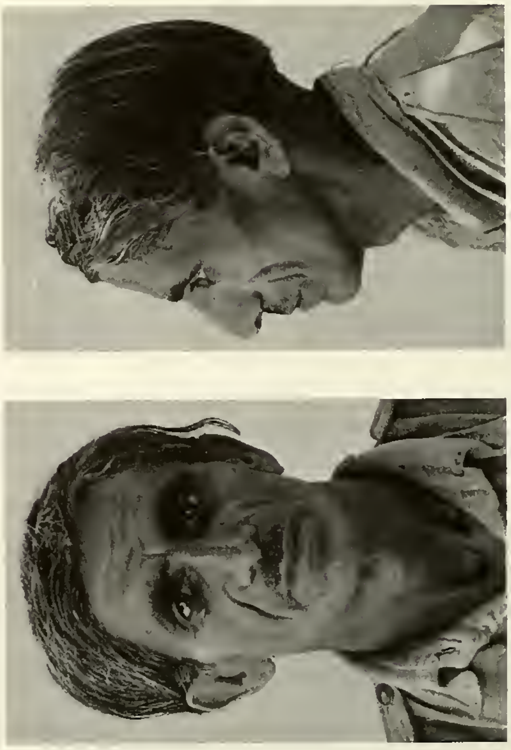
Baluchis at Turbat.



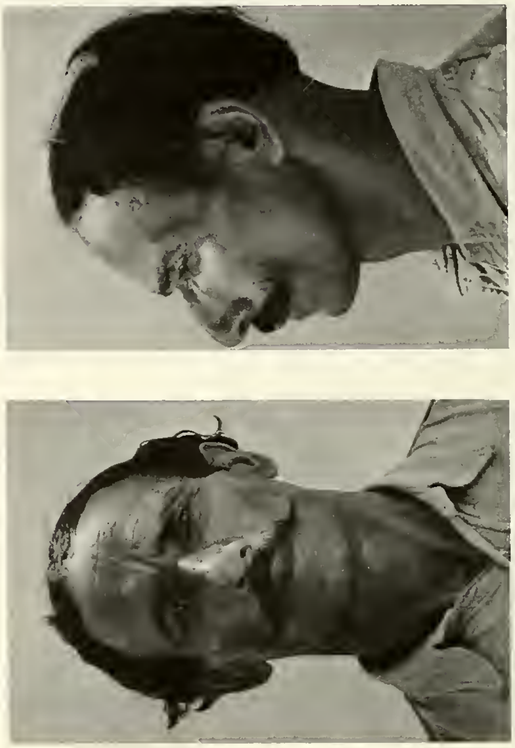
No. 13 (Age 42)



No. 33 (Age 45)

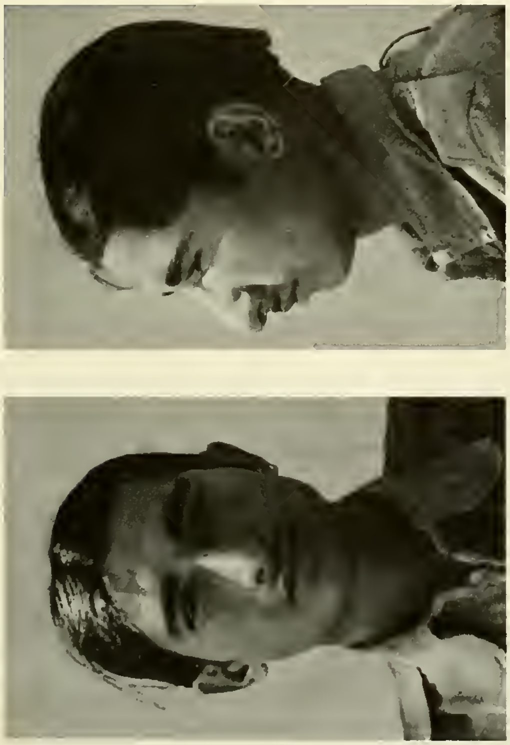


No. 30 (Age 45)

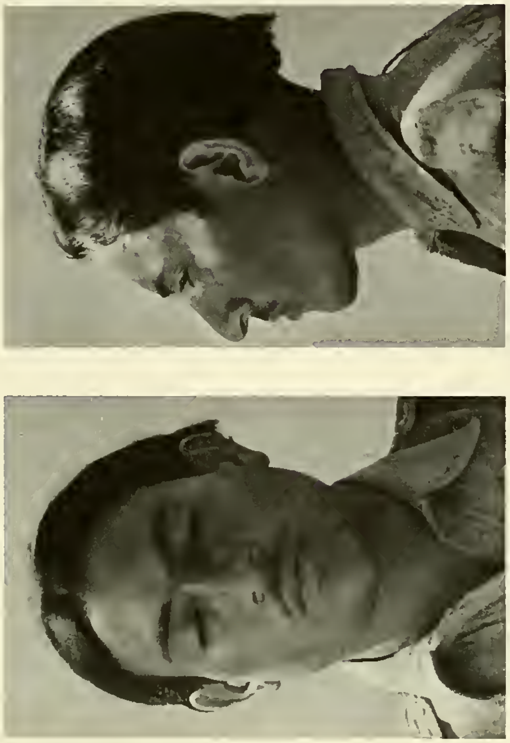


No. 10 (Age 45)

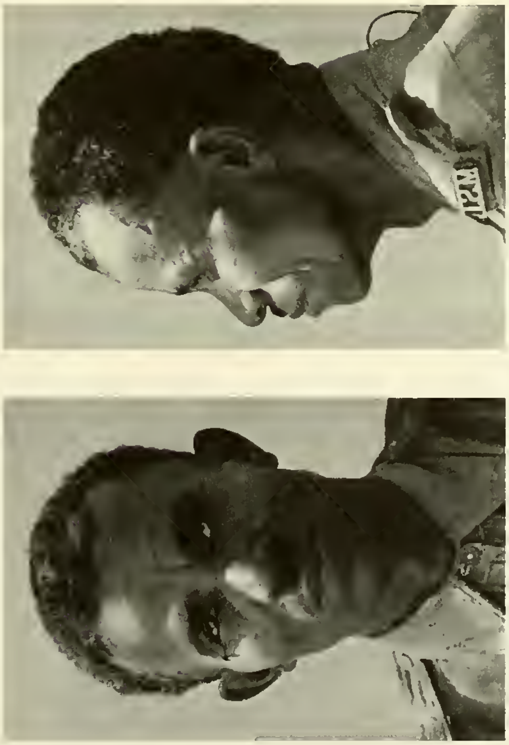
Baluchis at Turbat.



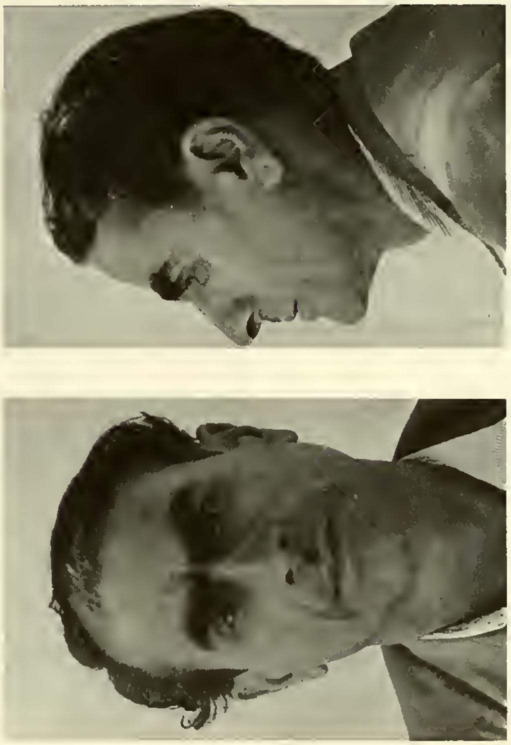
No. 29 (Age 20)



No. 20 (Age 20)

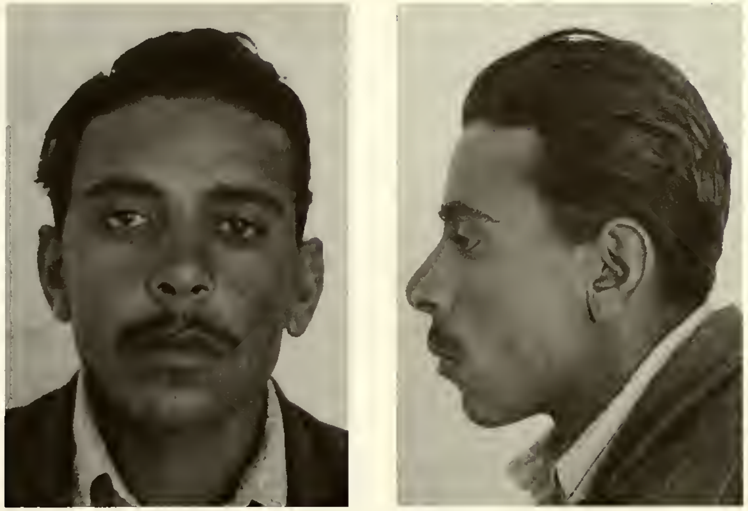


No. 21 (Age 40)

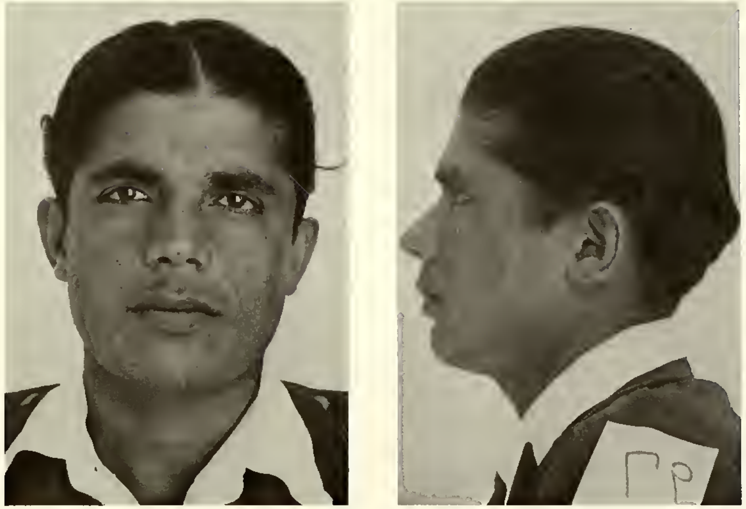


No. 34 (Age 42)

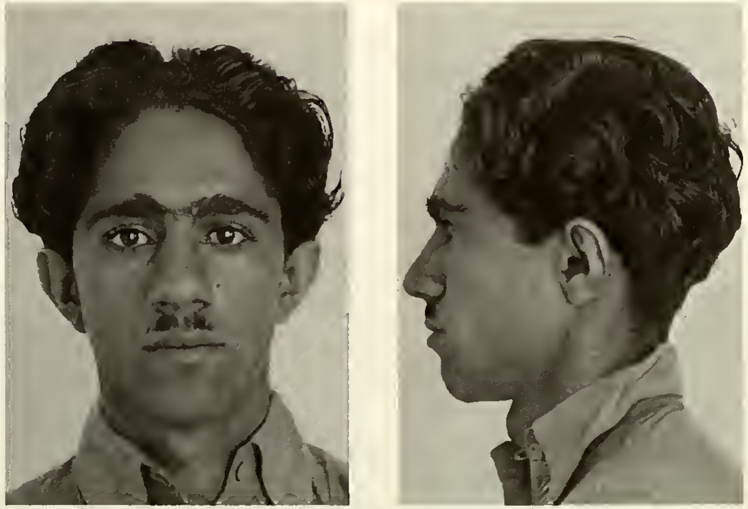
Baluchis at Turbat (Aberrant types).



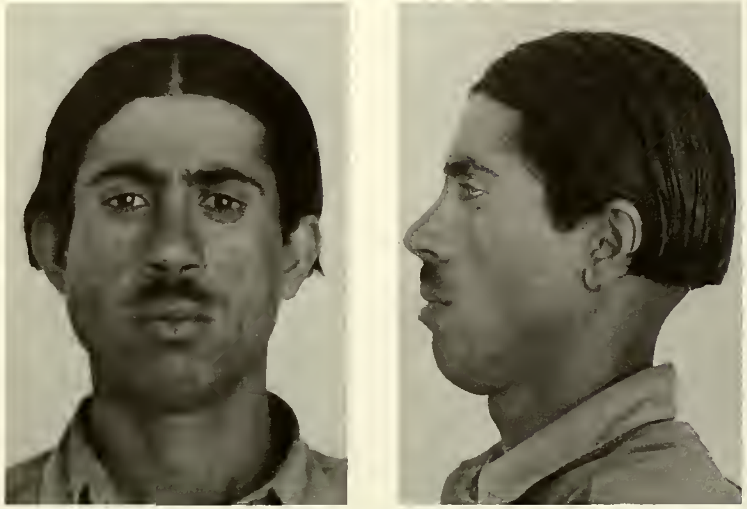
No. 8 (Age 19)



No. 97 (Age 19)

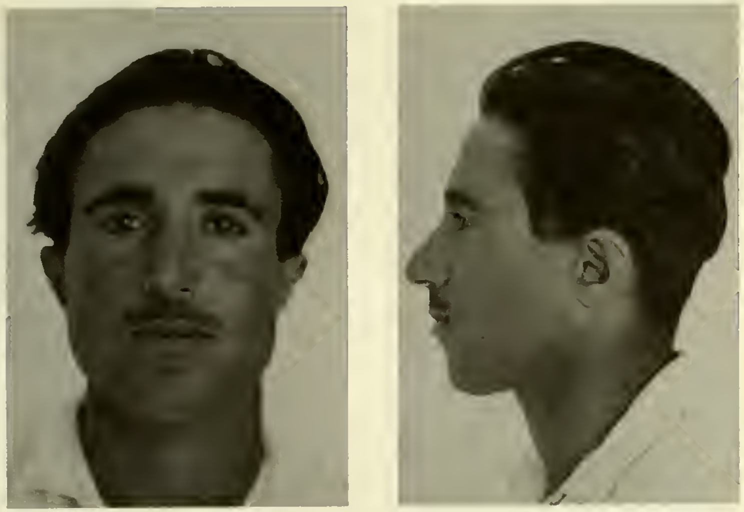


No. 14 (Age 20)

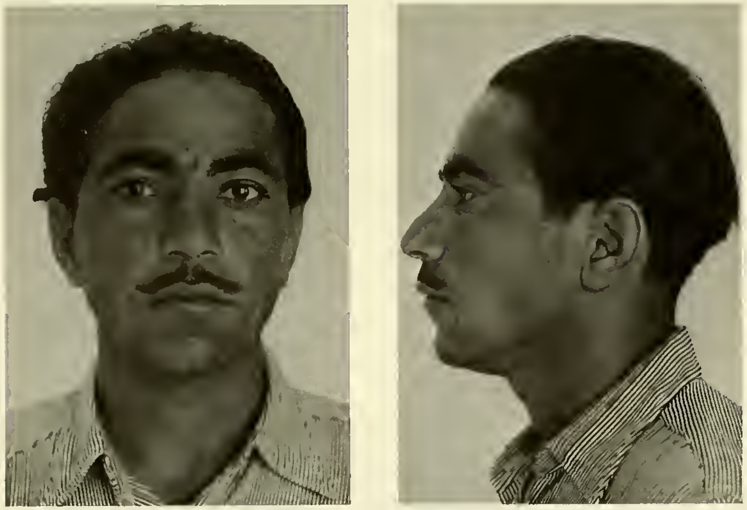


No. 13 (Age 20)

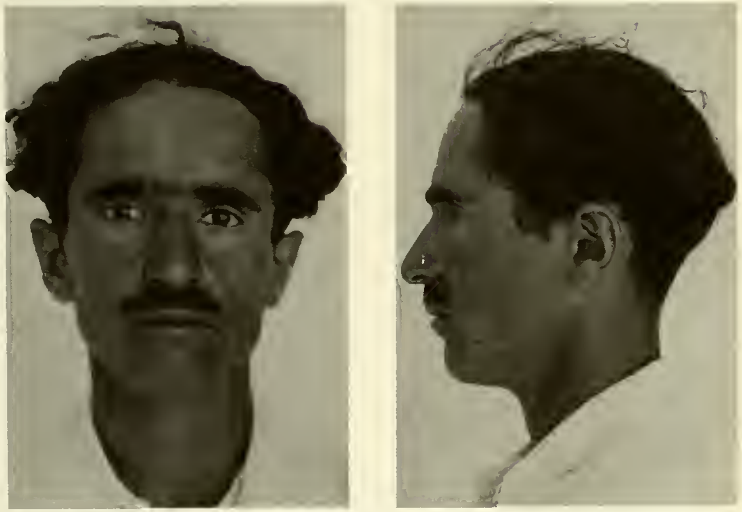
Baluchis at Panjgur.



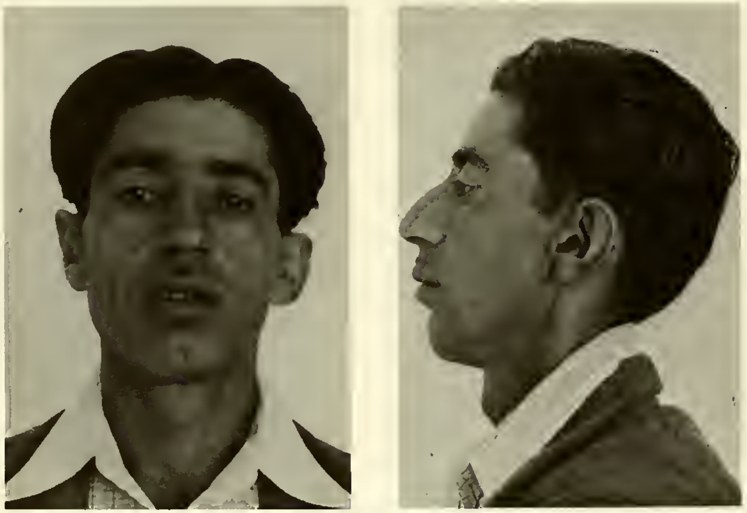
No. 32 (Age 21)



No. 31 (Age 21)

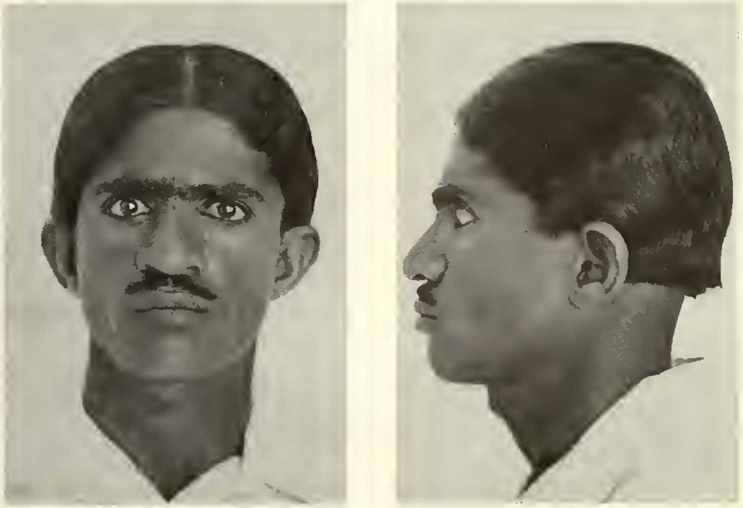


No. 28 (Age 21)

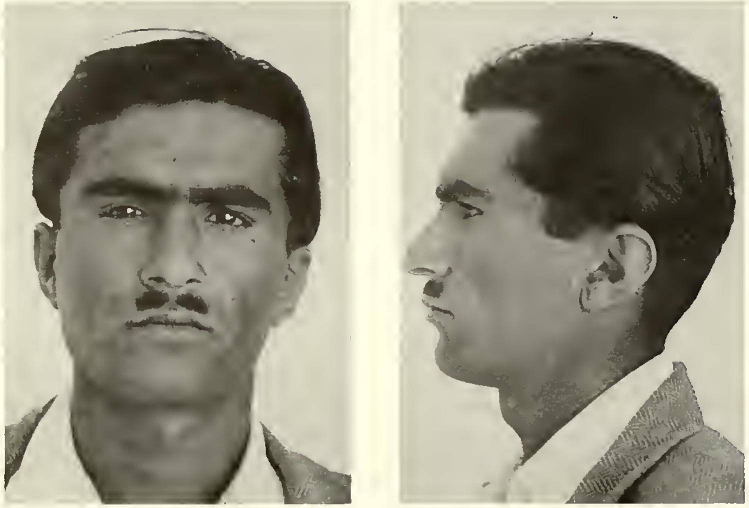


No. 29 (Age 21)

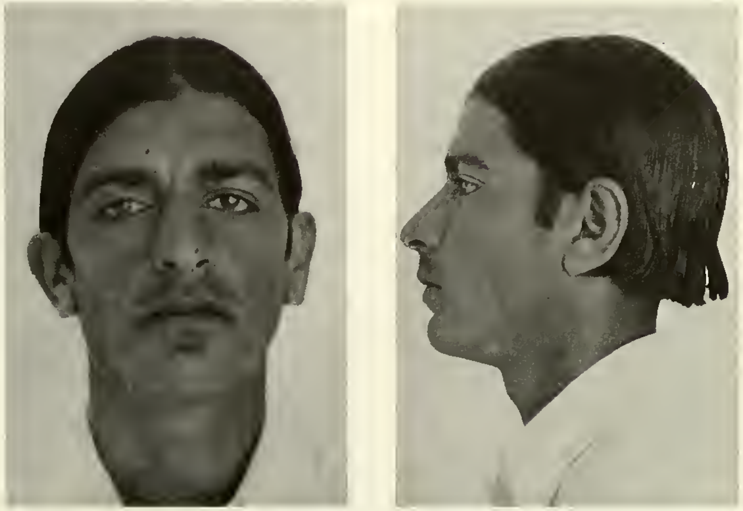
Baluchis at Panjgur.



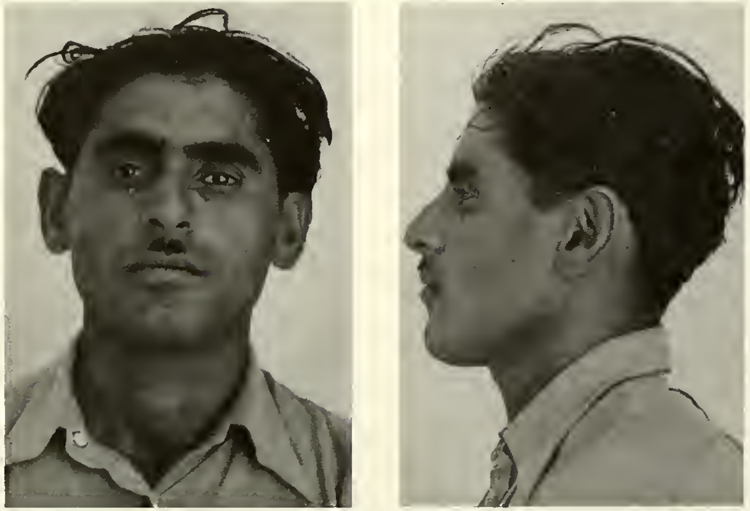
No. 26 (Age 22)



No. 30 (Age 22)

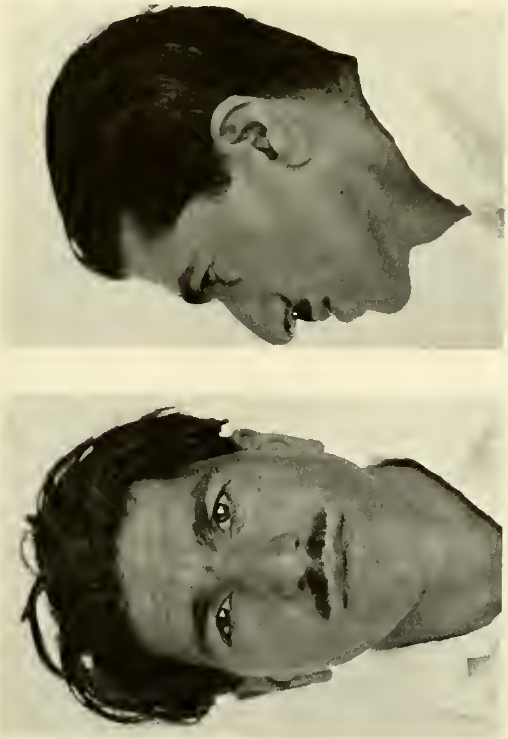


No. 33 (Age 22)

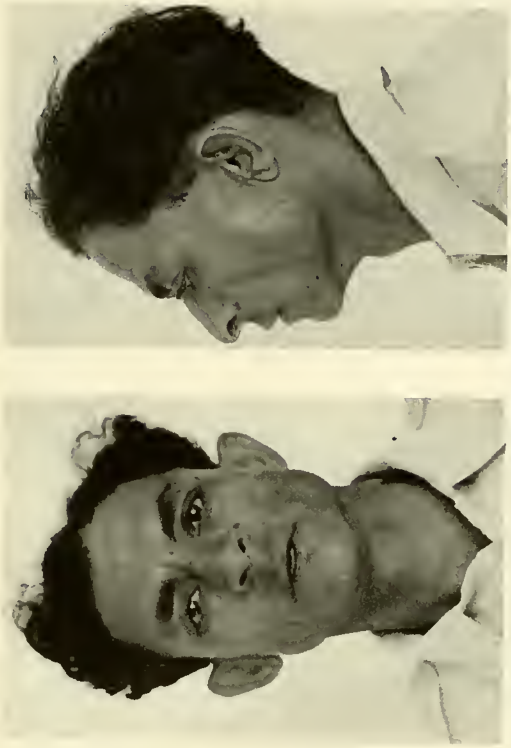


No. 102 (Age 22)

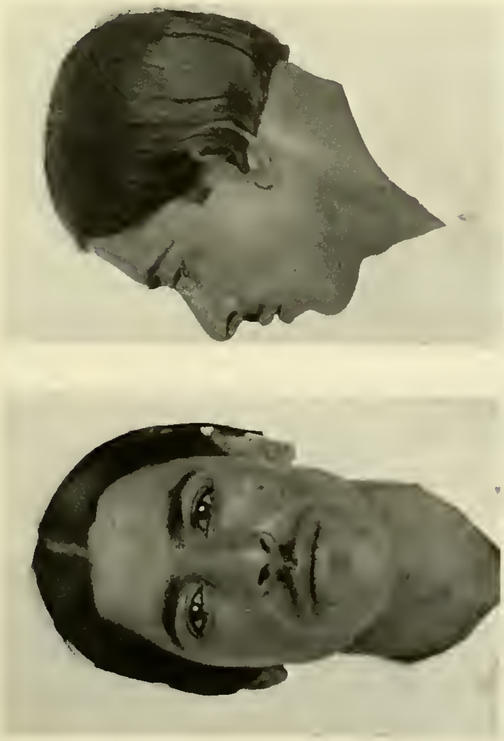
Baluchis at Panjgur.



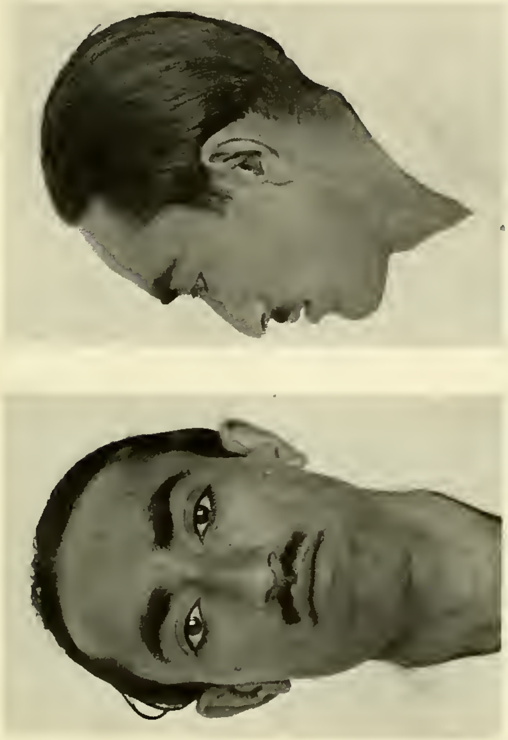
No. 27 (Age 24)



No. 4 (Age 25)

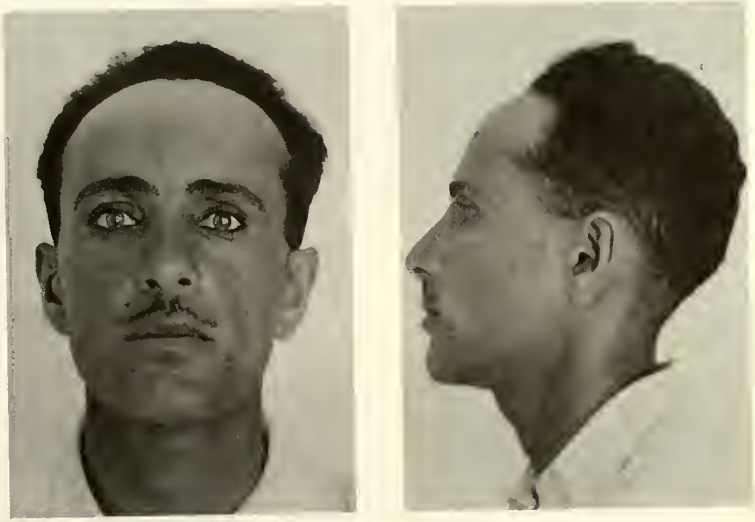


No. 11 (Age 23)



No. 10 (Age 24)

Baluchis at Panjgur.



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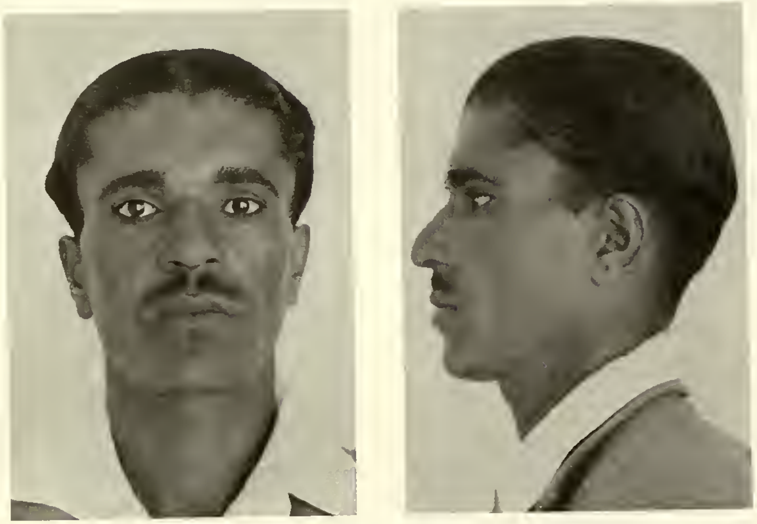

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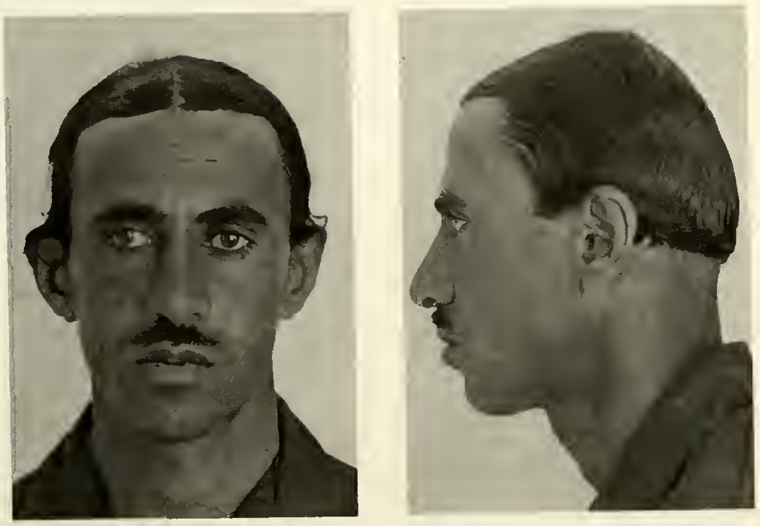

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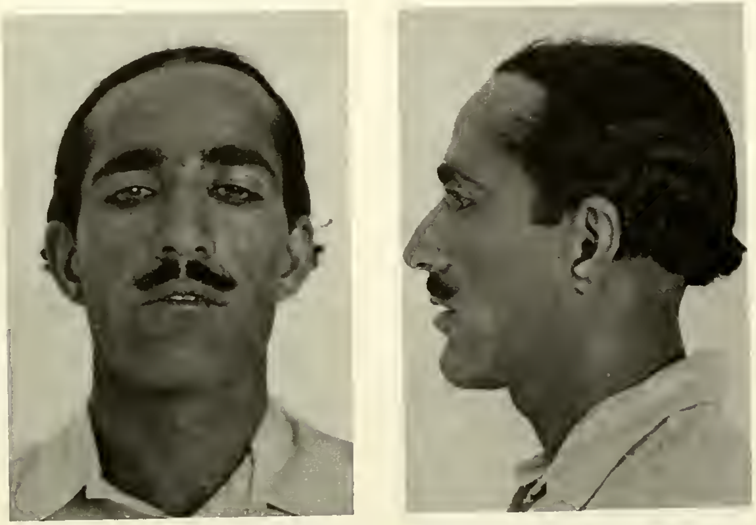
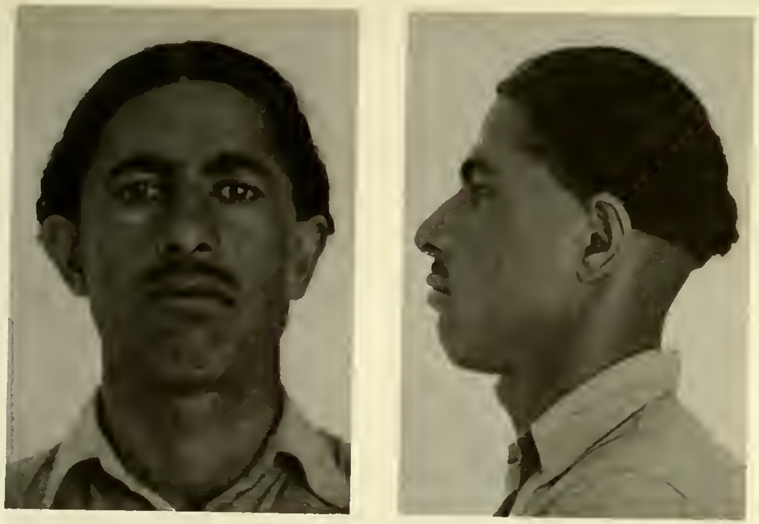


No. 24 (Age 25)

Baluchis at Panjgur.



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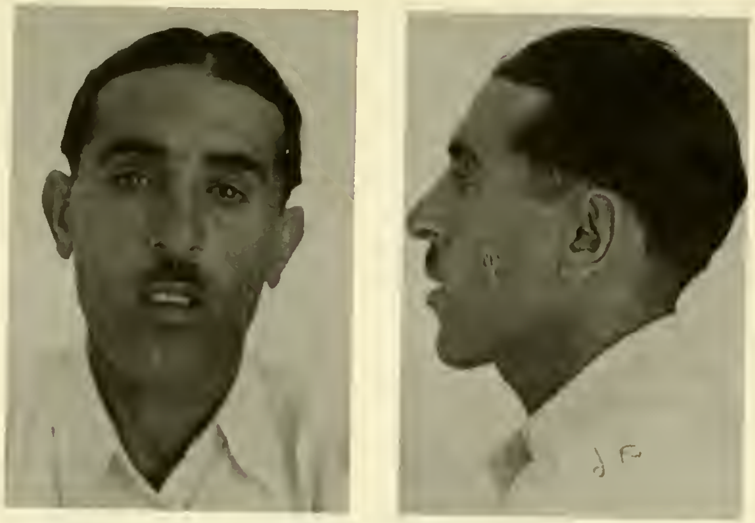
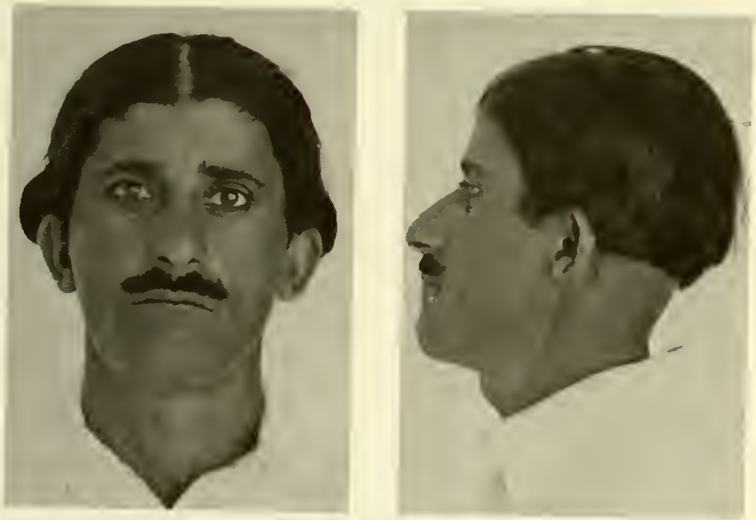
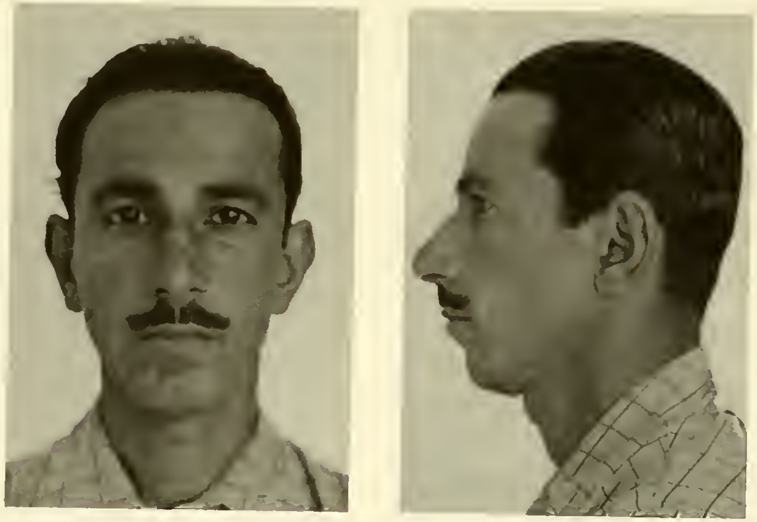


No. 96 (Age 25)

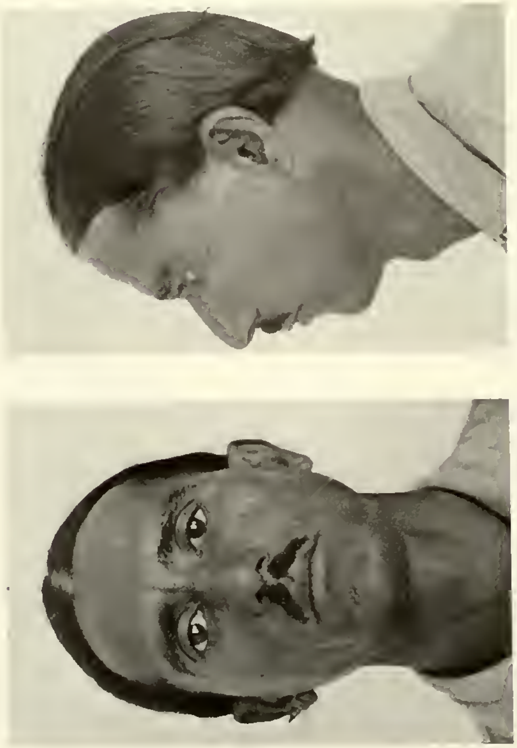


No. 20 (Age 26)

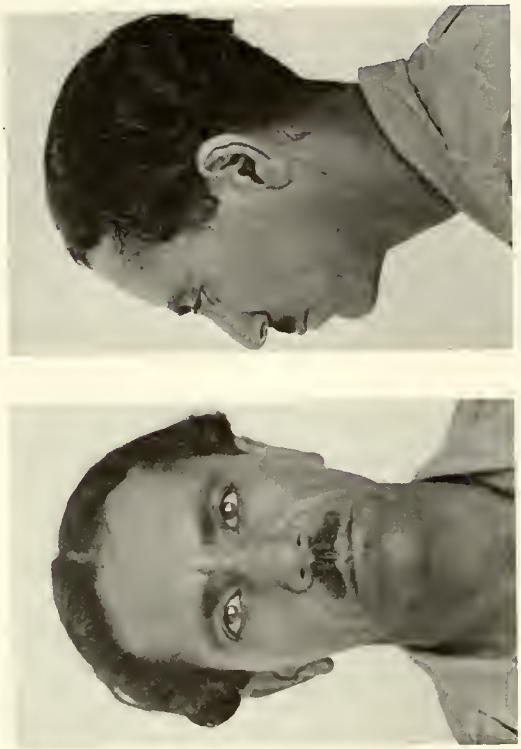


No. 16 (Age 28)

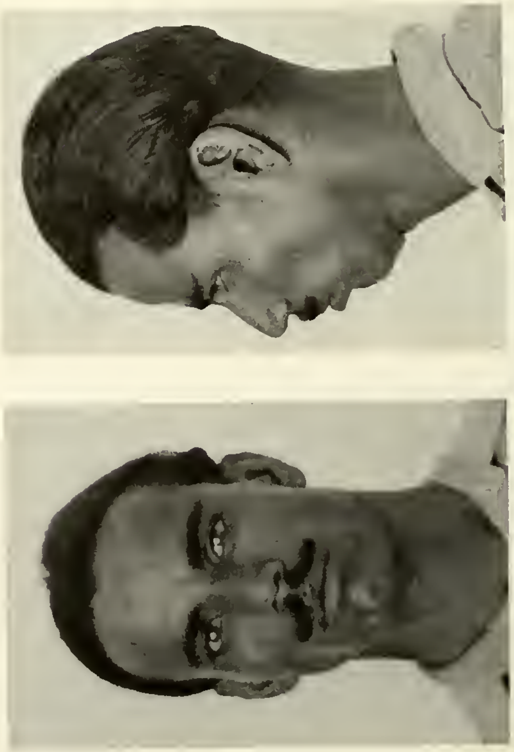
Baluchis at Panjgur.



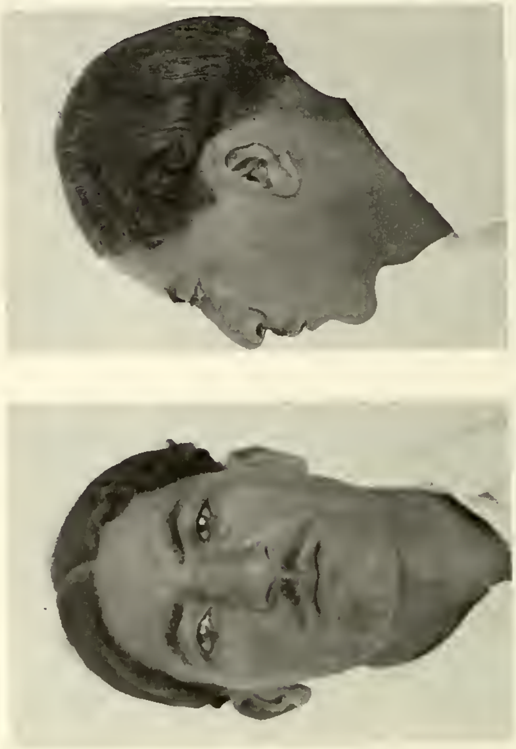
No. 18 (Age 29)



No. 21 (Age 30)

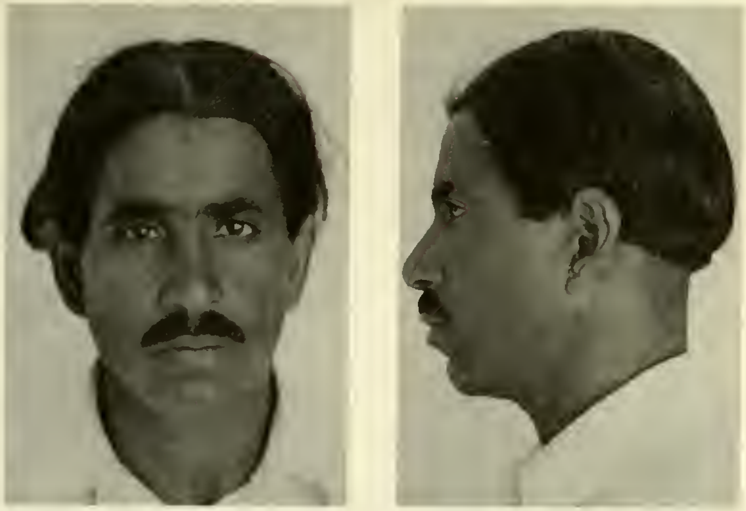


No. 2 (Age 30)

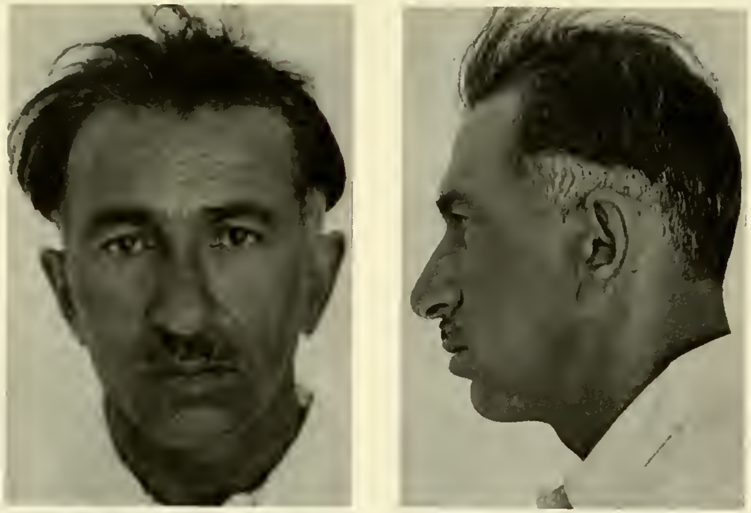


No. 19 (Age 30)

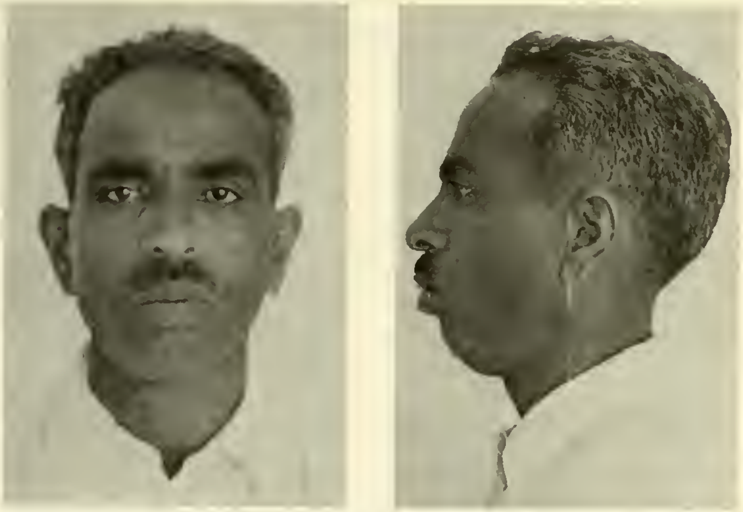
Baluchis at Panjgur.



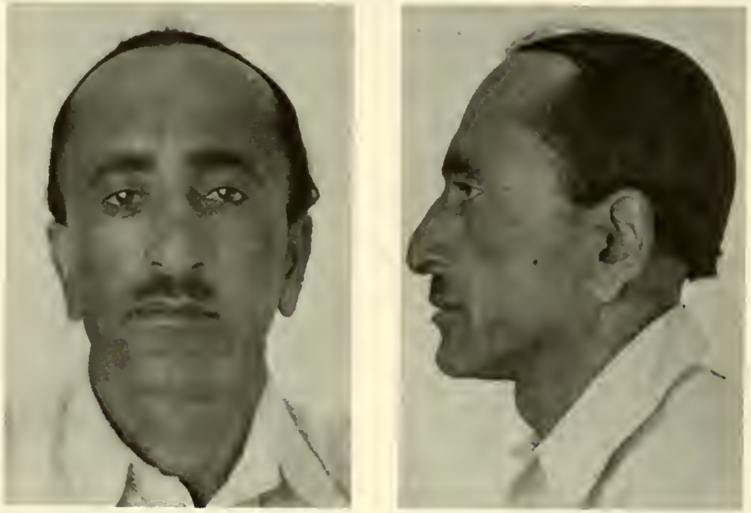
No. 9 (Age 30)



No. 34 (Age 35)

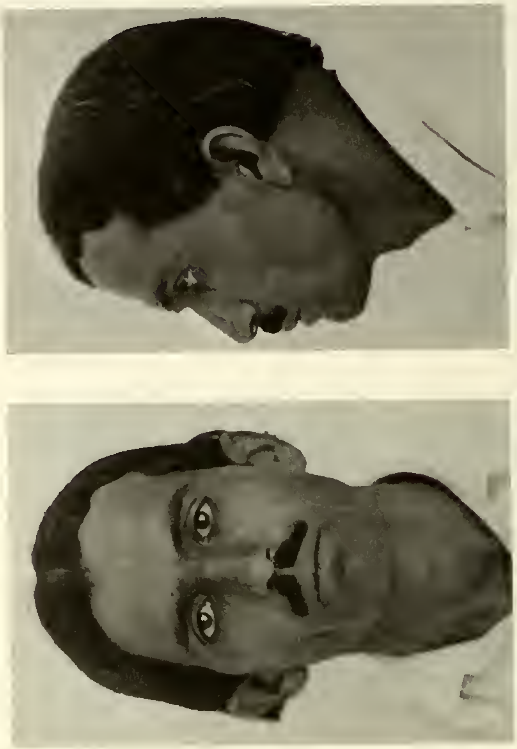


No. 7 (Age 35)

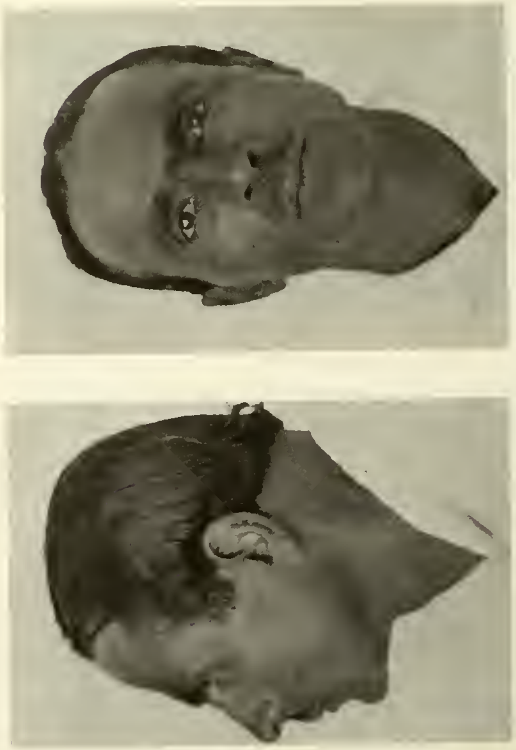


No. 1 (Age 35)

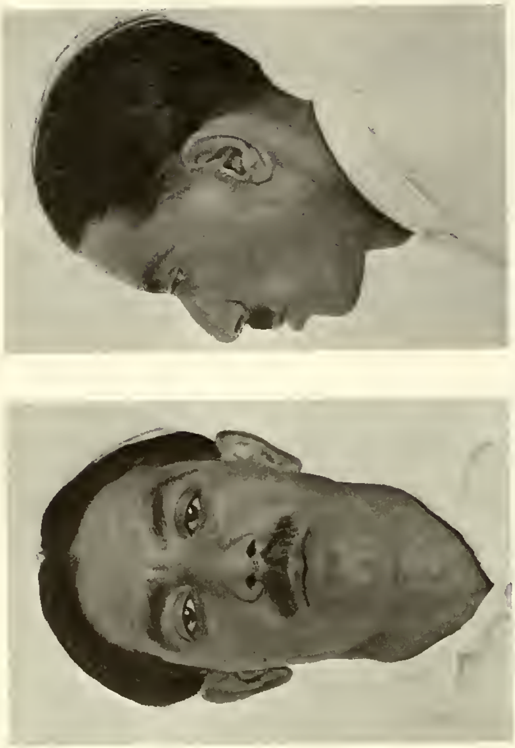
Baluchis at Panjgur.



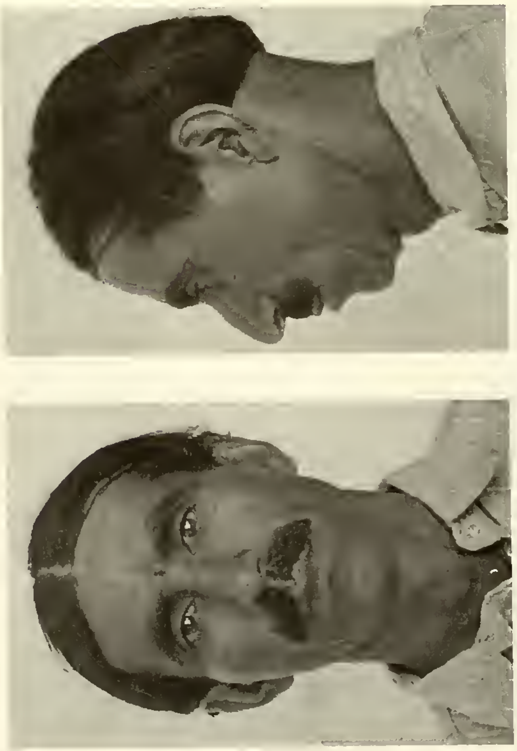
No. 103 (Age 40)



No. 3 (Age 37)

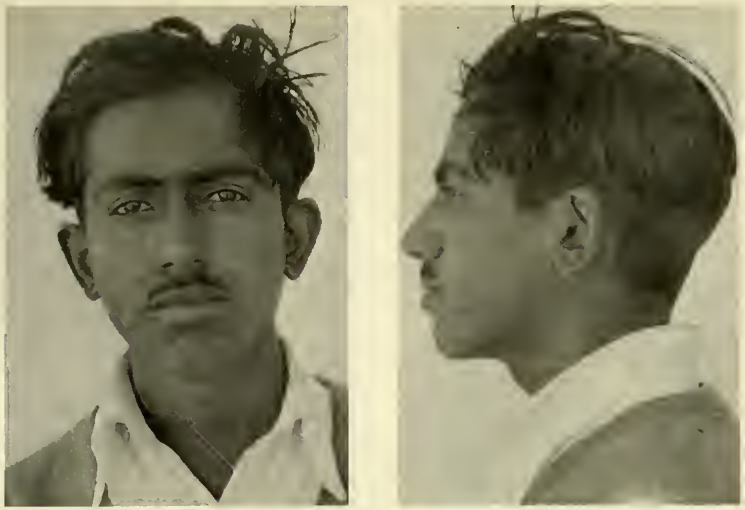


No. 6 (Age 36)

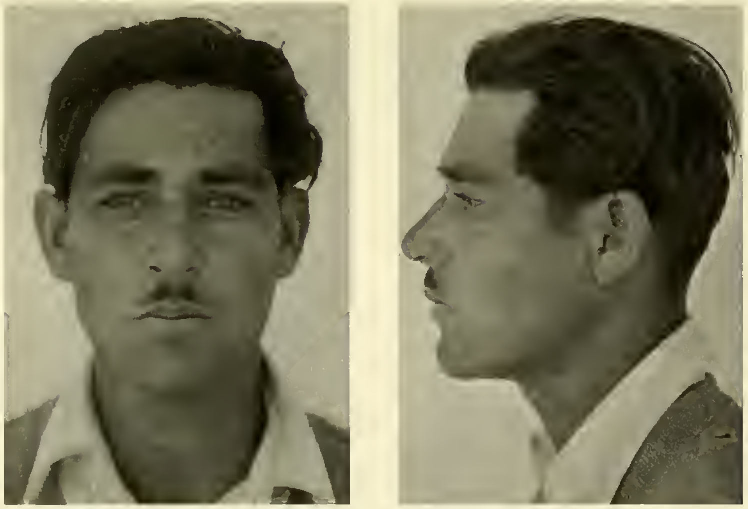


No. 5 (Age 36)

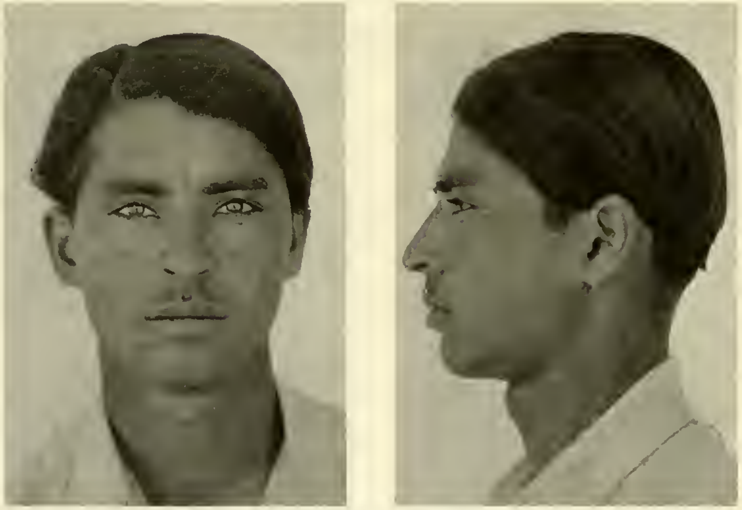
Baluchis at Panjgur.



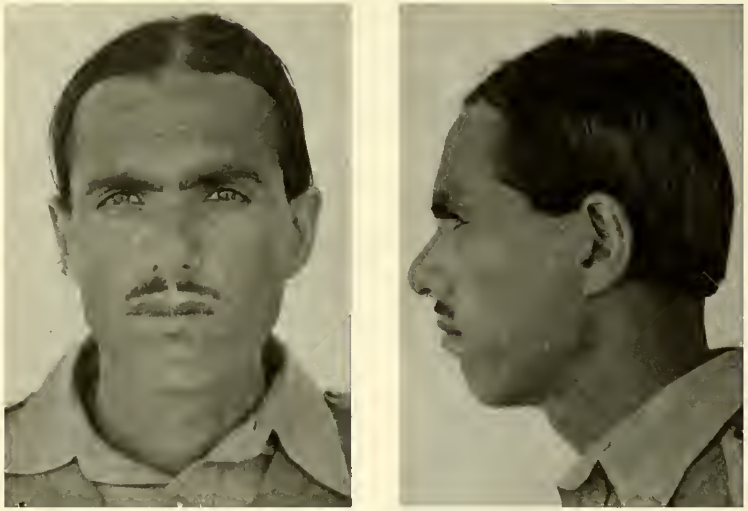
No. 86 (Age 20)



No. 89 (Age 20)

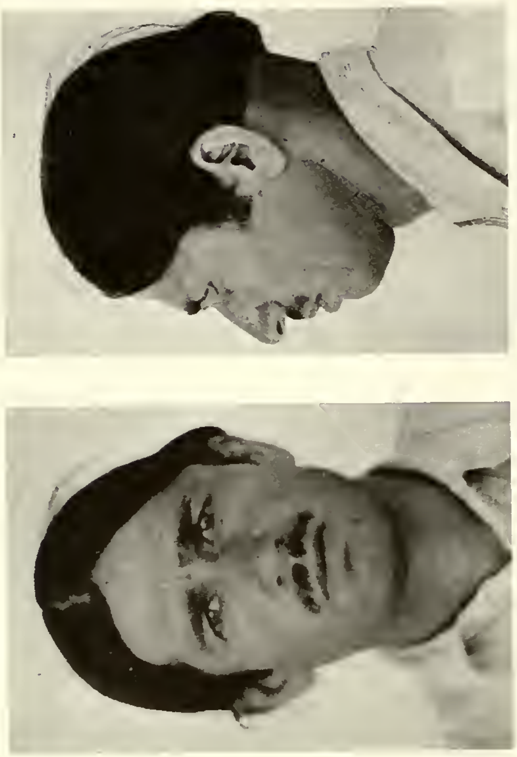


No. 78 (Age 20)

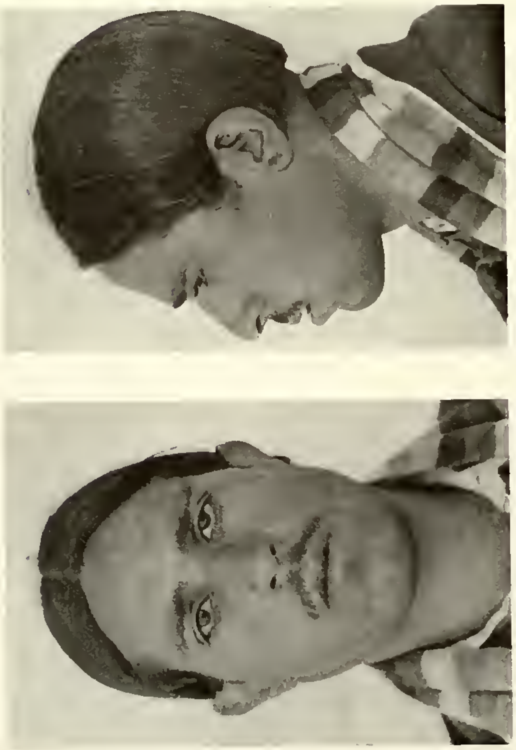


No. 108 (Age 30)

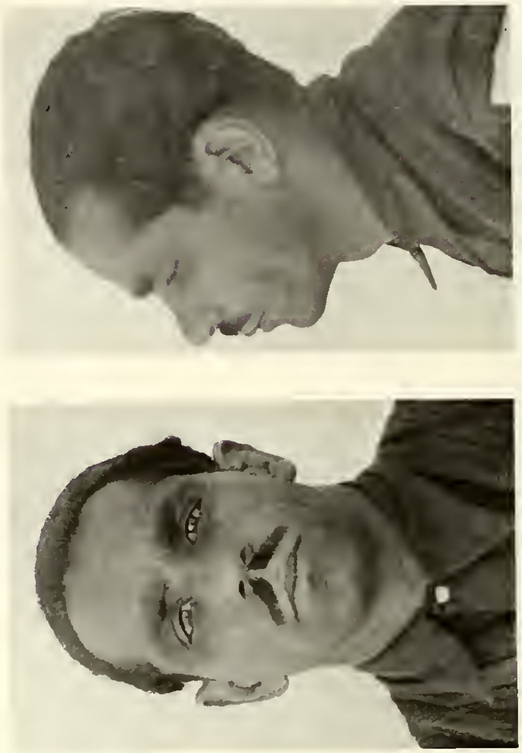
Baluchis at Kalat.



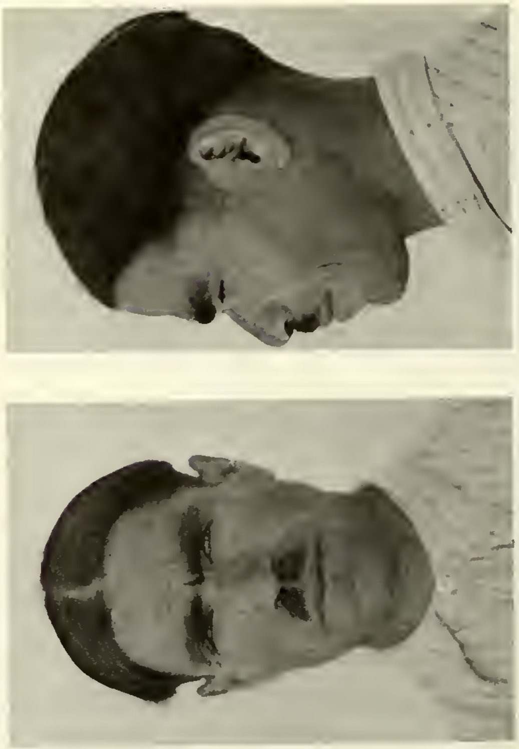
No. 107 (Age 35)



No. 70 (Age 30)

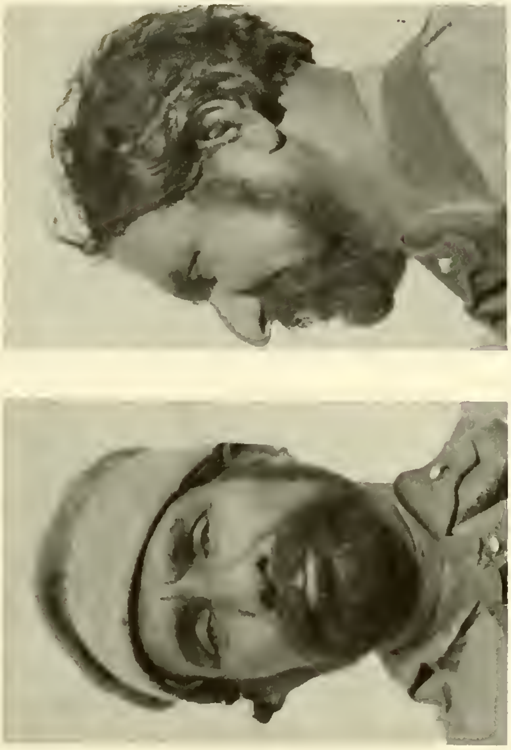


No. 85 (Age 40)

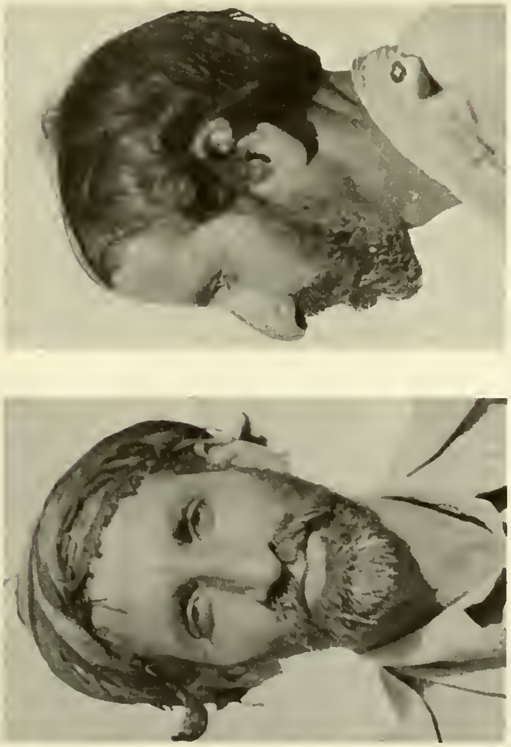


No. 84 (Age 40)

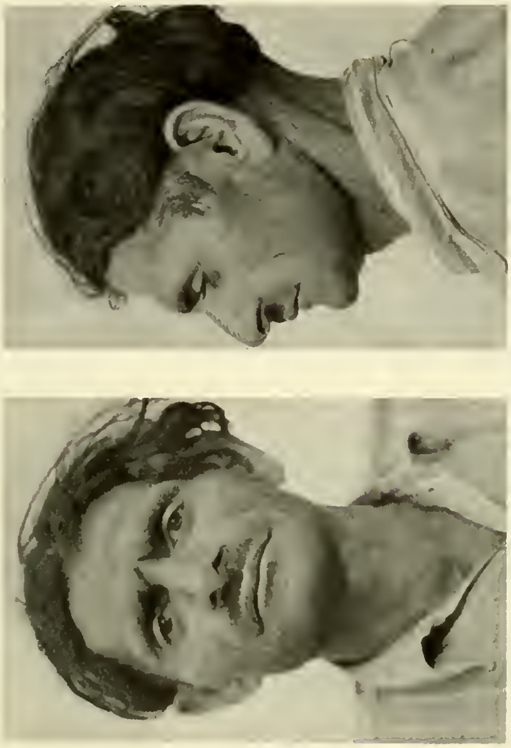
Baluchis at Kalat.



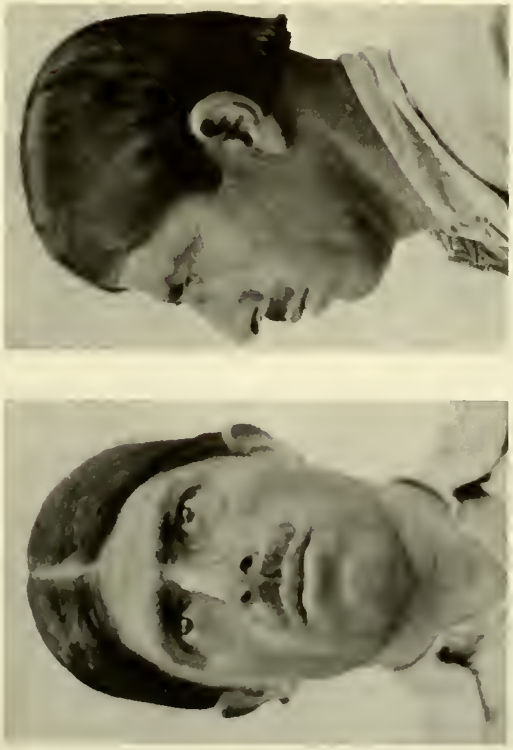
No. 1



No. 2

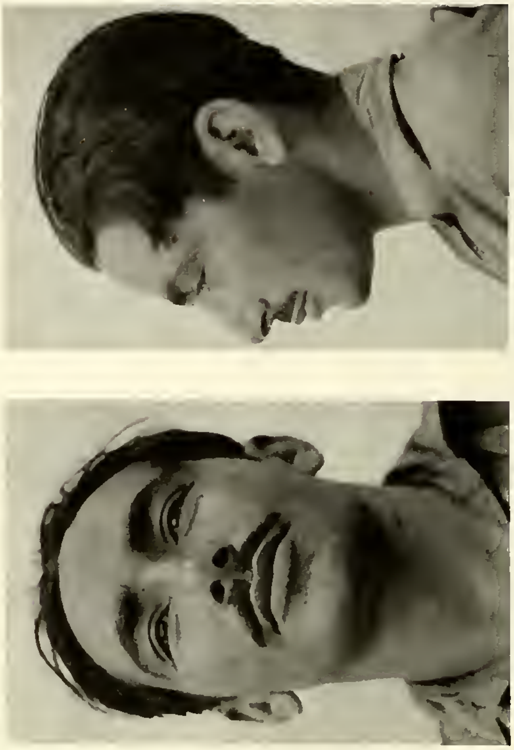


No. 3

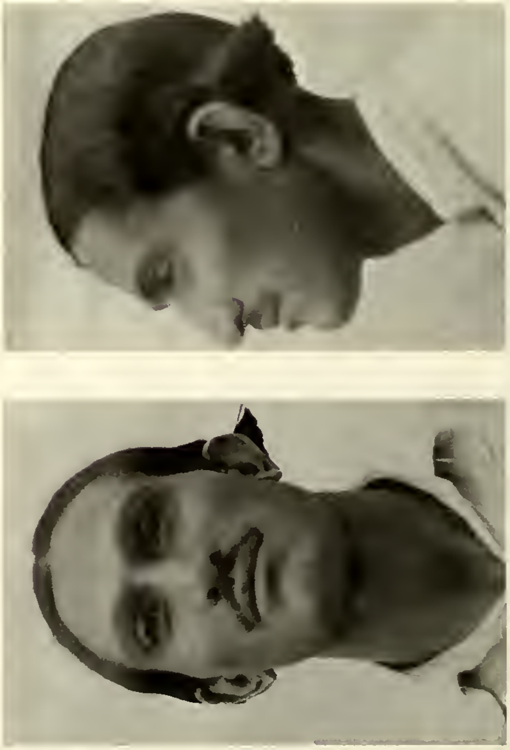


No. 5

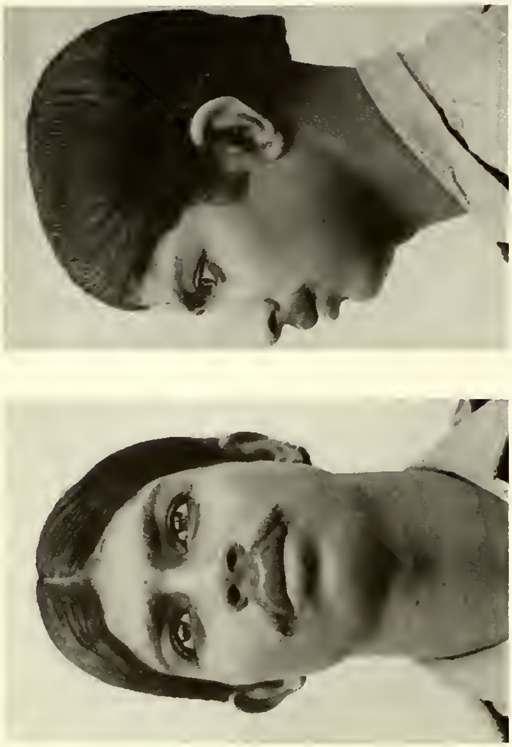
Baluchis at Mand.



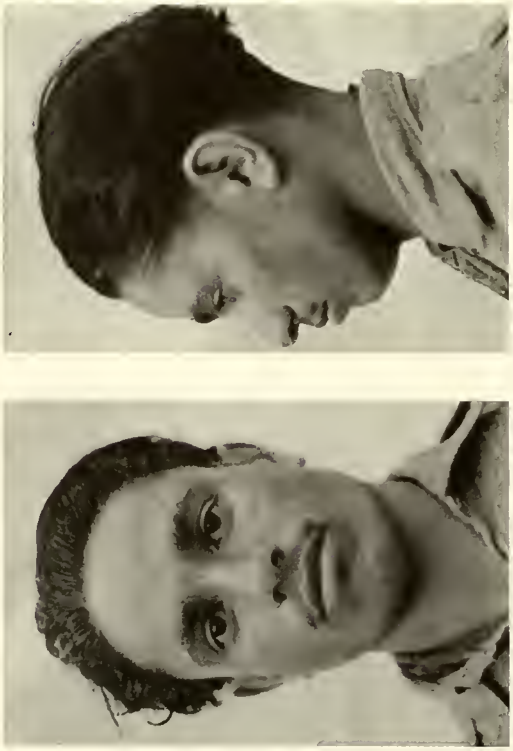
No. 7



No. 10

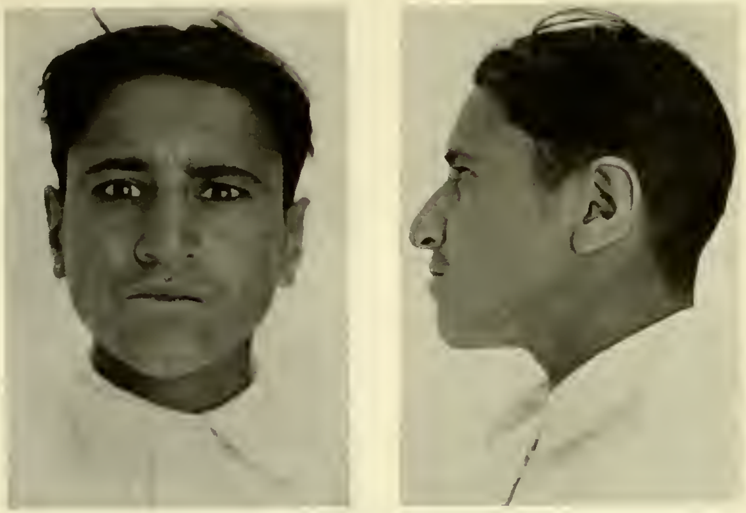


No. 9

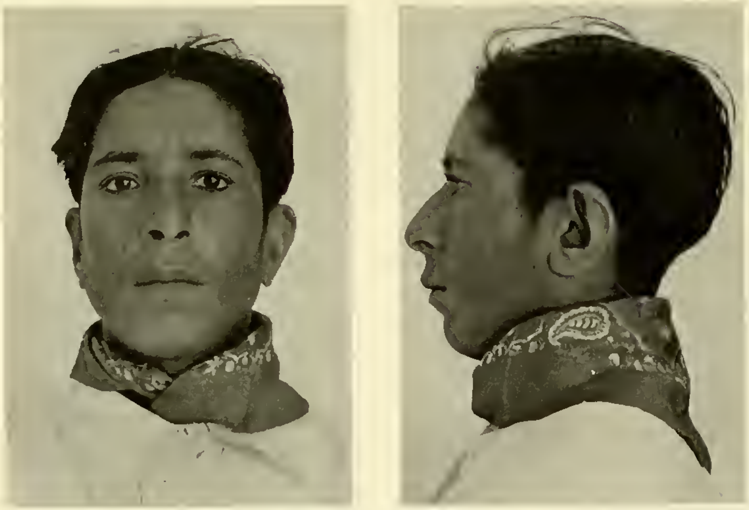


No. 8

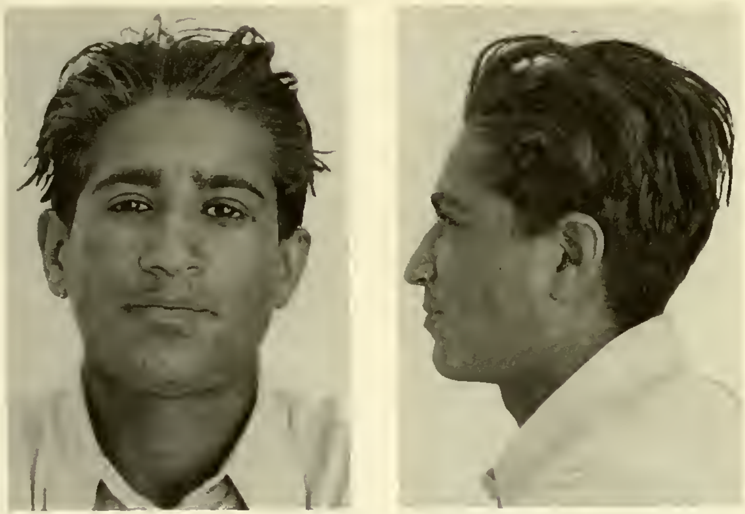
Brahuis at Mand.



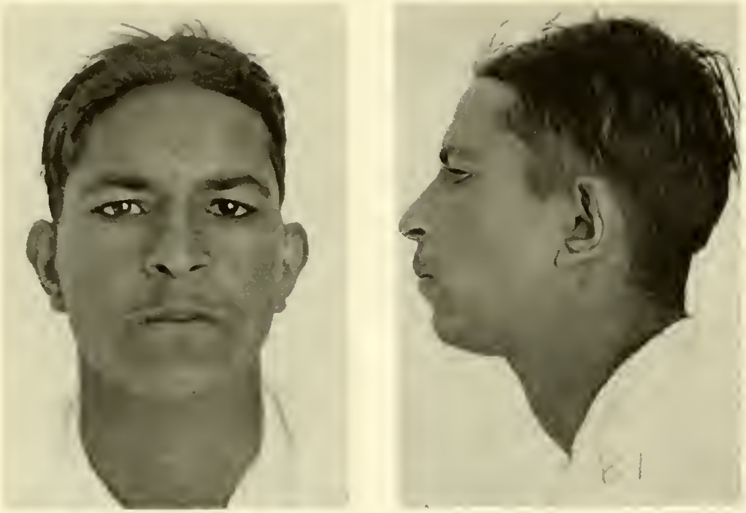
No. 88 (Age 18)



No. 52 (Age 18)

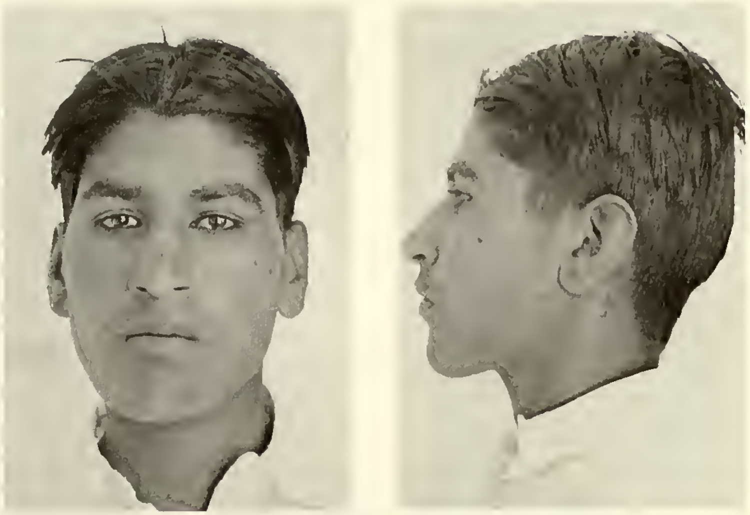


No. 63 (Age 18)

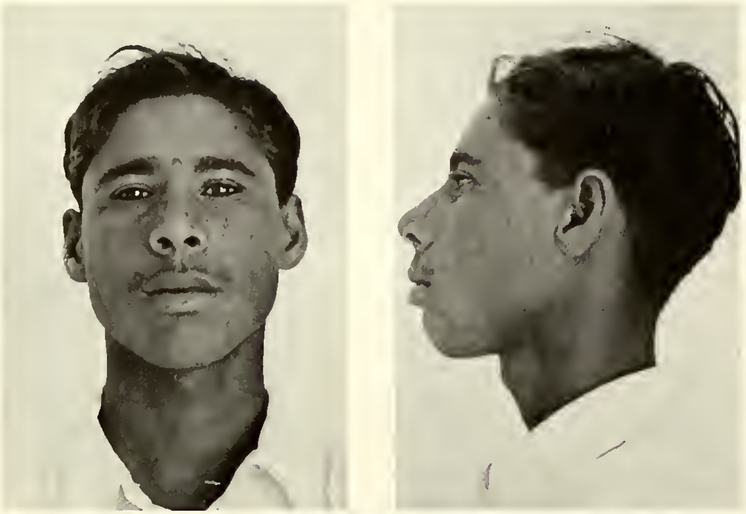


No. 78 (Age 18)

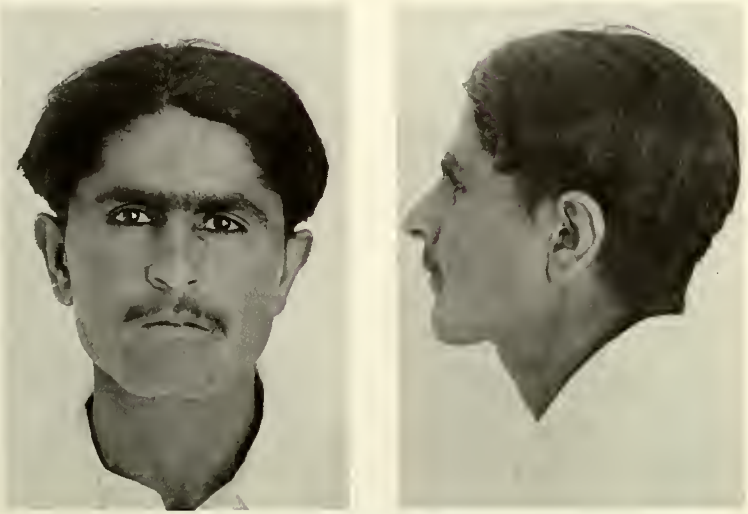
Brahuis at Panjgur.



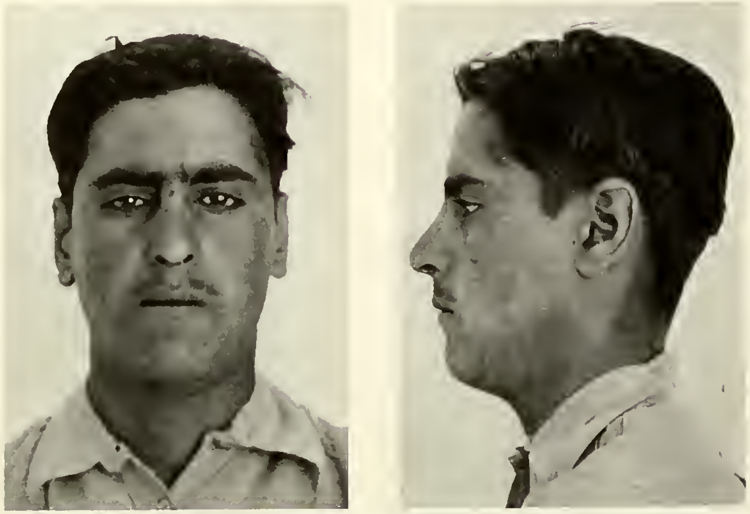
No. 56 (Age 18)



No. 51 (Age 18)

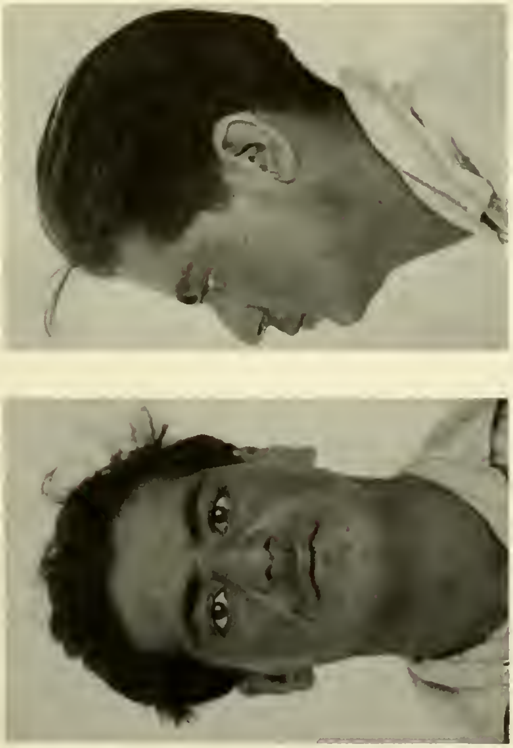


No. 59 (Age 18)

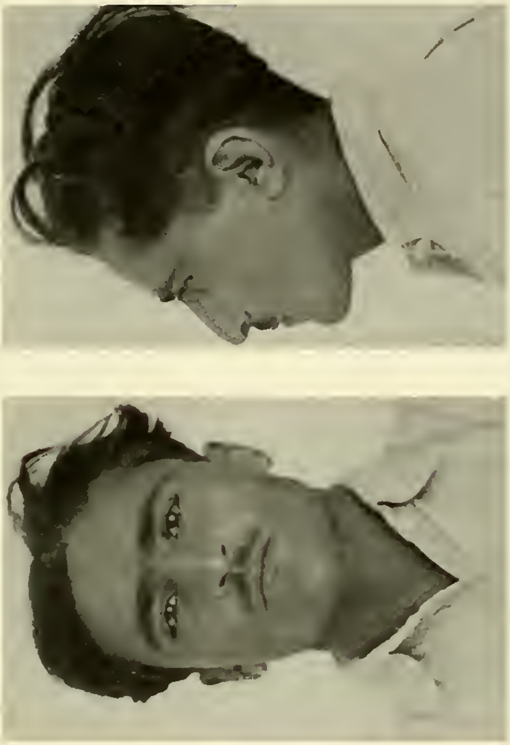


No. 69 (Age 18)

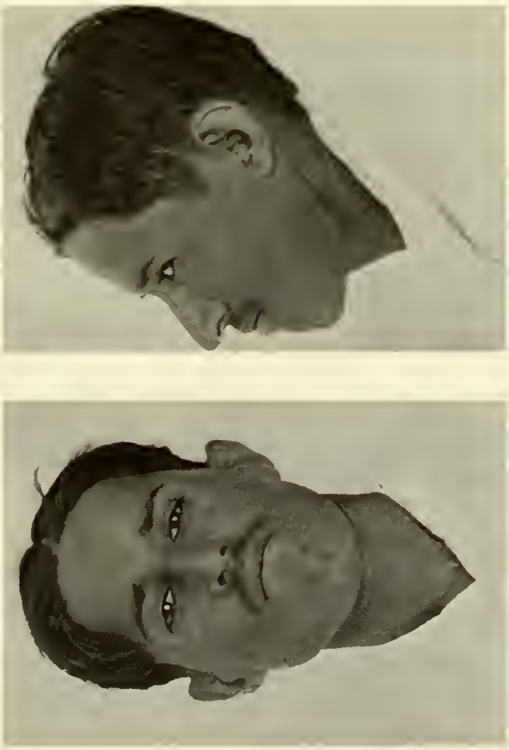
Brahuis at Panjgur.



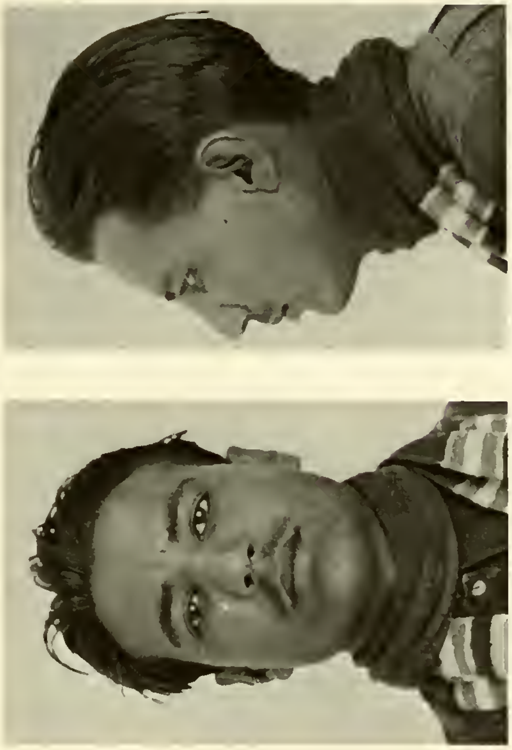
No. 48 (Age 18)



No. 81 (Age 18)

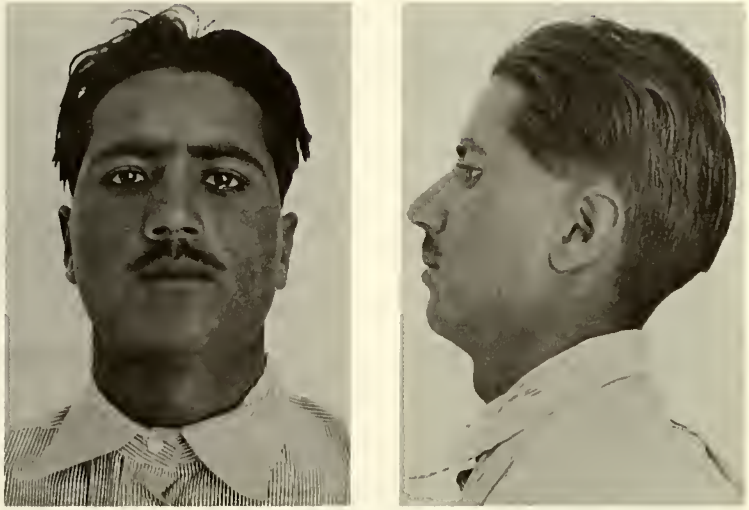


No. 83 (Age 18)



No. 74 (Age 18)

Brahuis at Panjgur.



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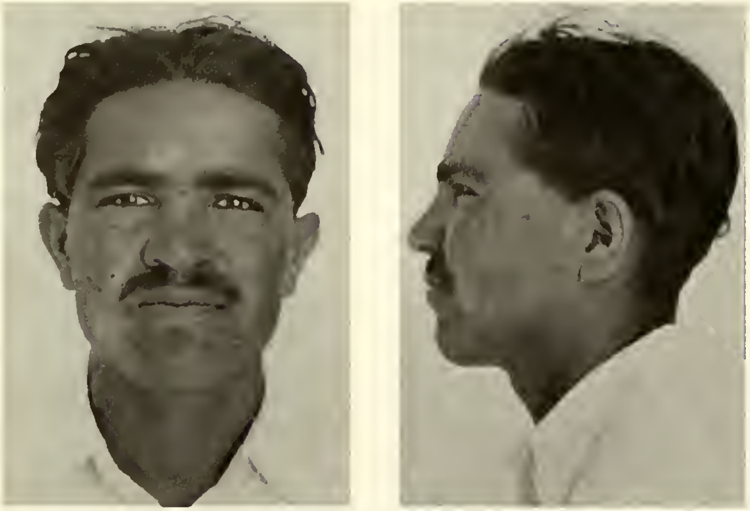

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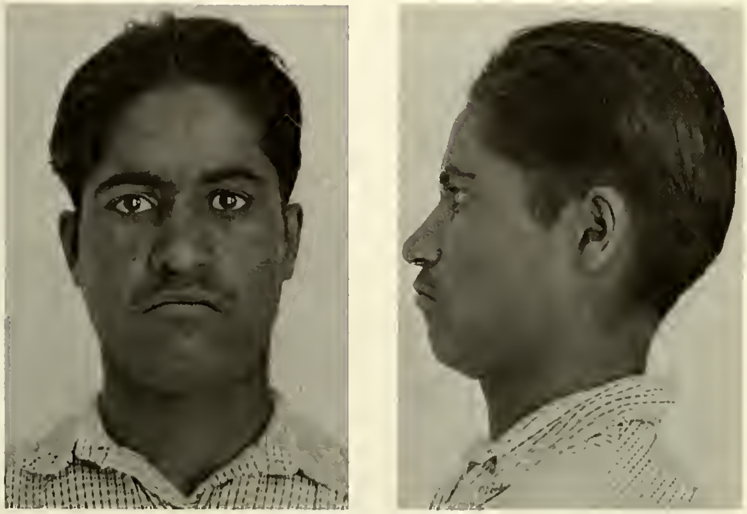

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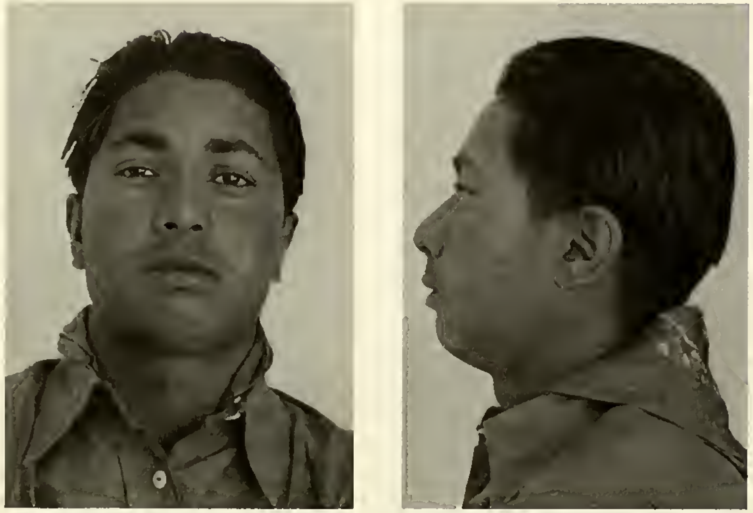
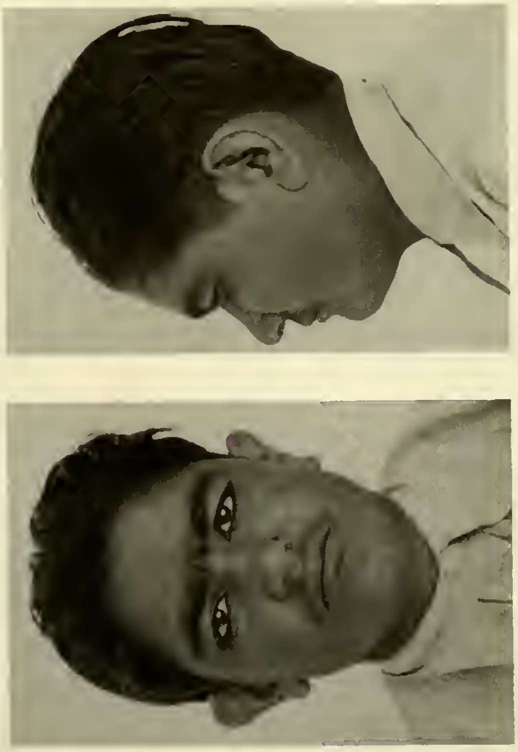


No. 53 (Age 18)

Brahuis at Panjgur.



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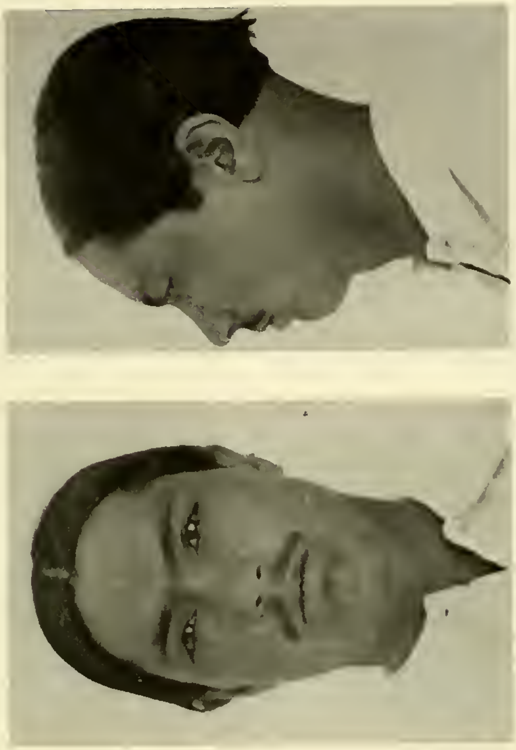

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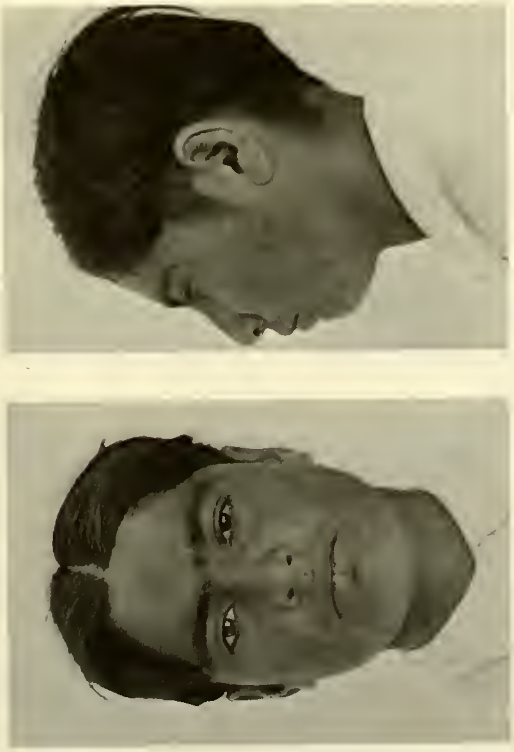

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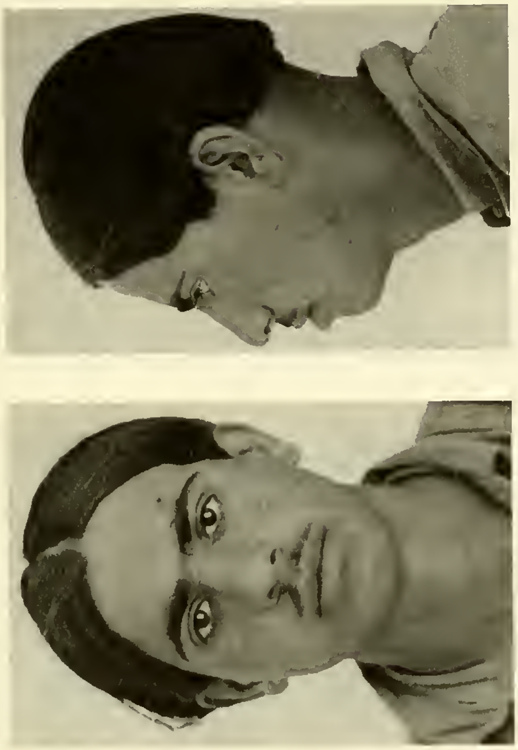

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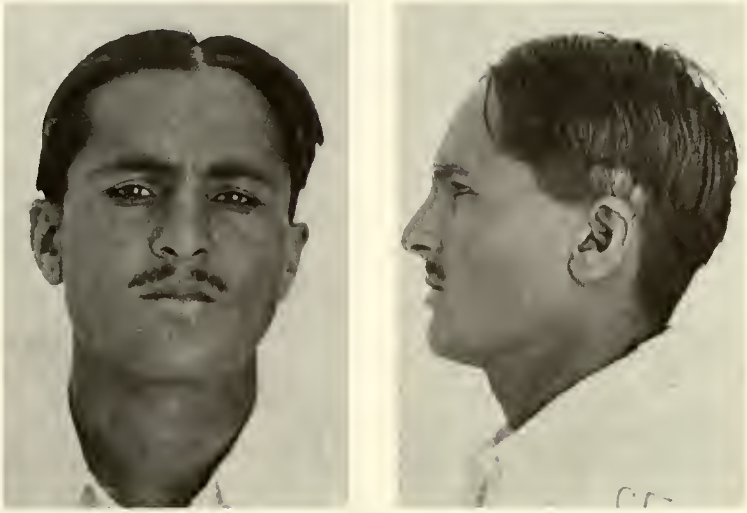
Brahuis at Panjgur.



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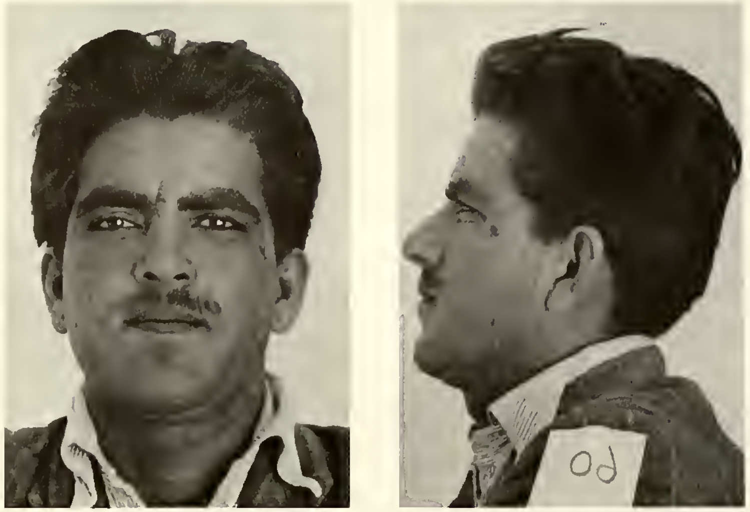

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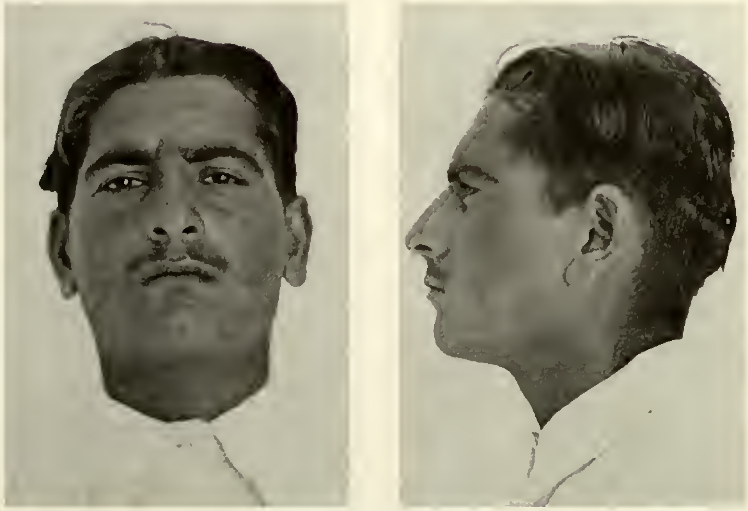

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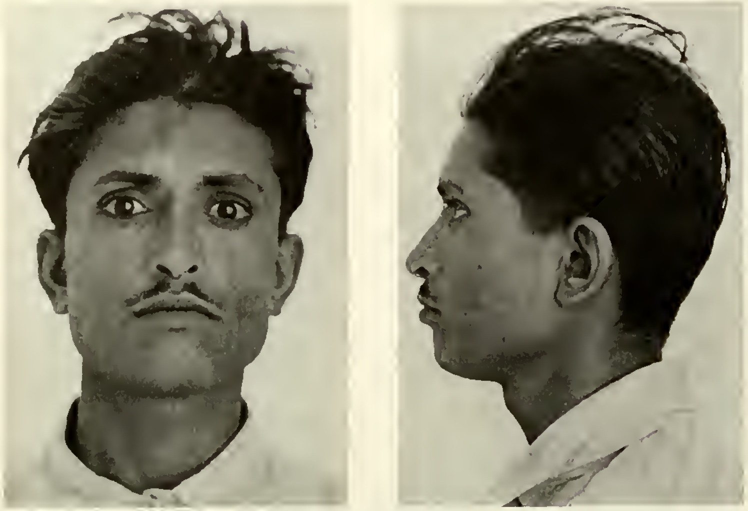

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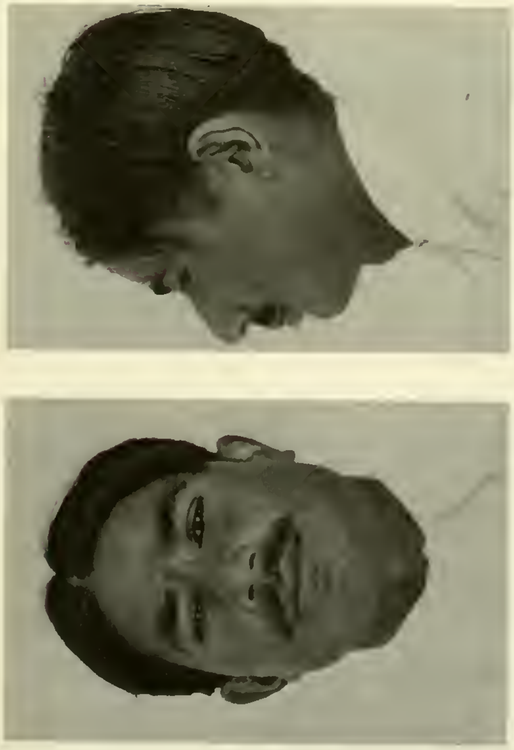
Brahuis at Panjgur.



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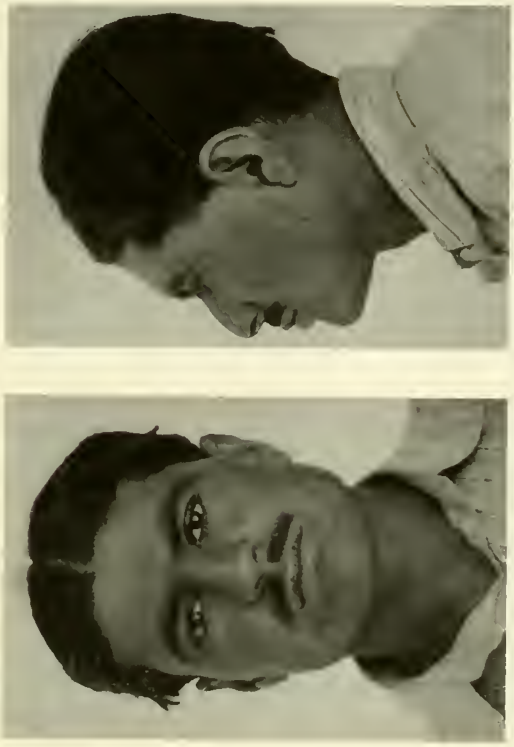

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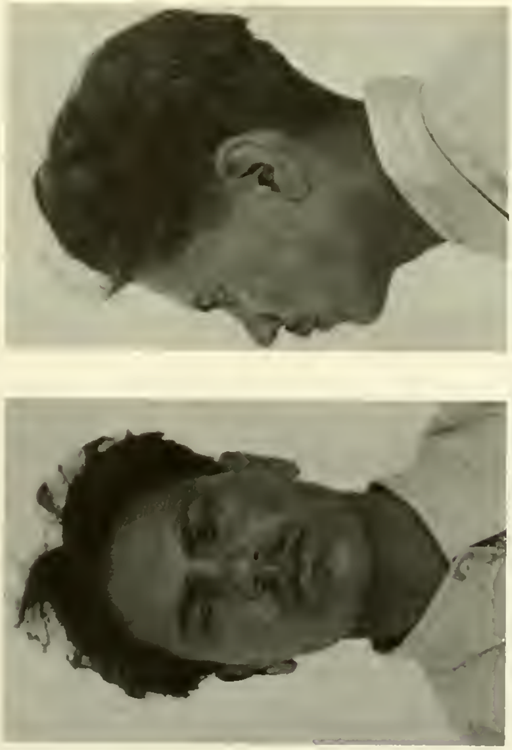

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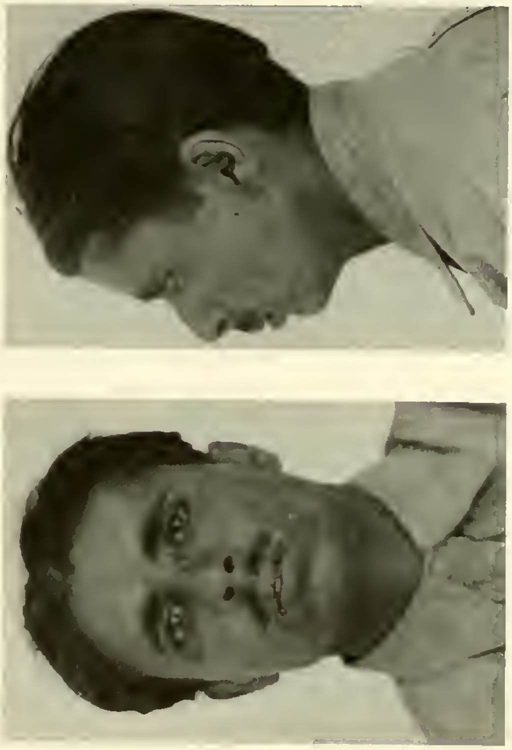
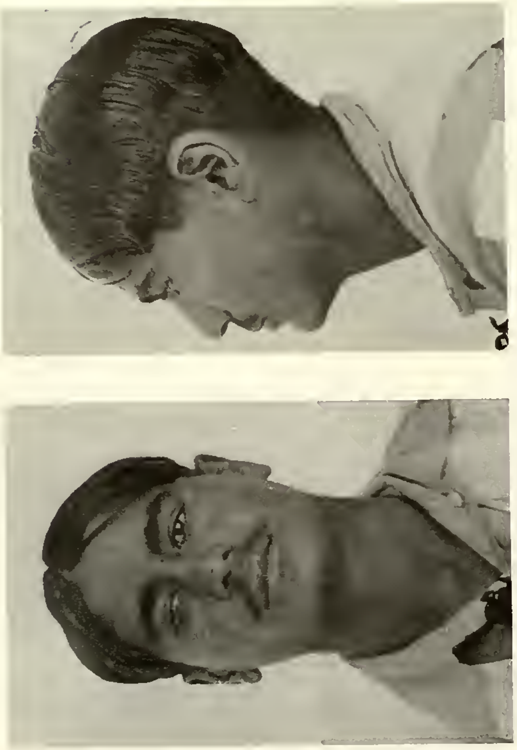


No. 82 (Age 20)

Brahuis at Panjgur.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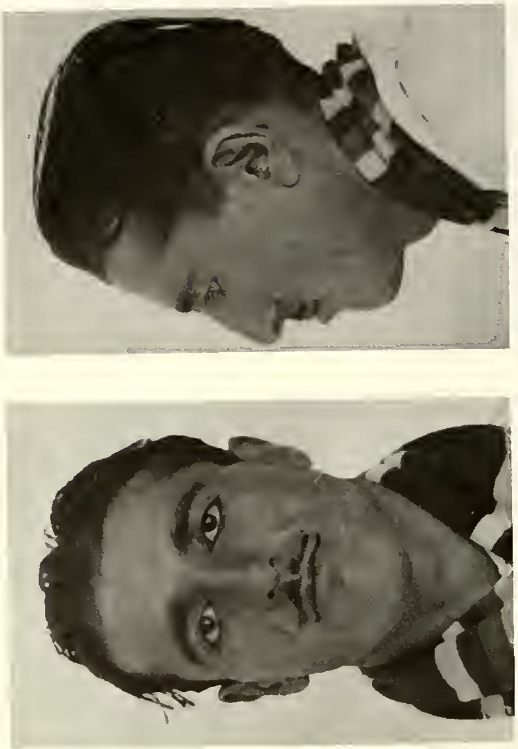
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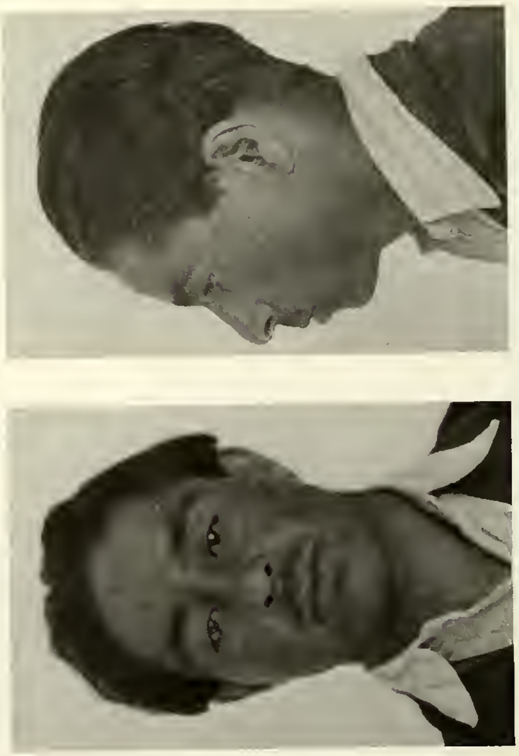
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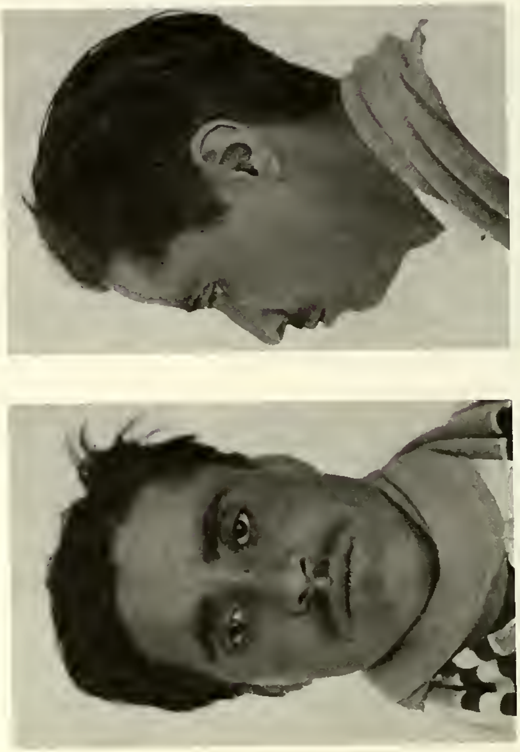
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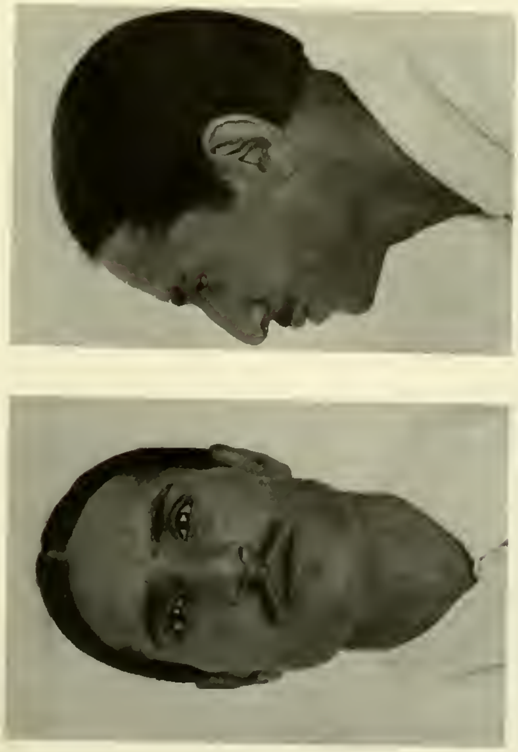
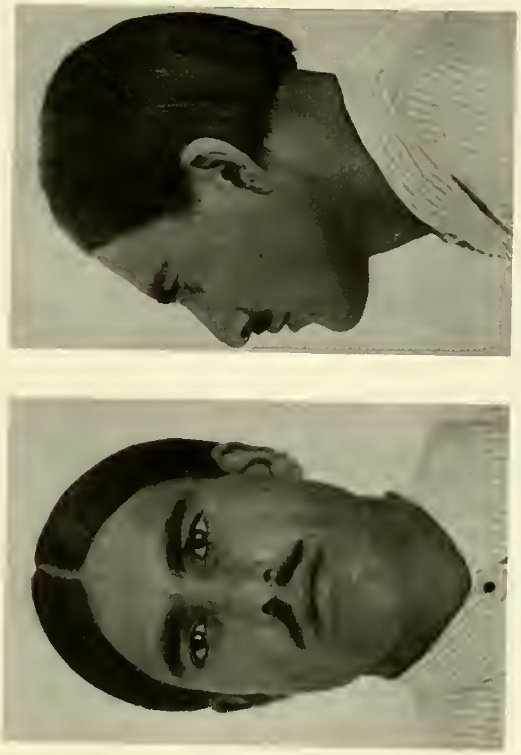


No. 40 (Age 25)



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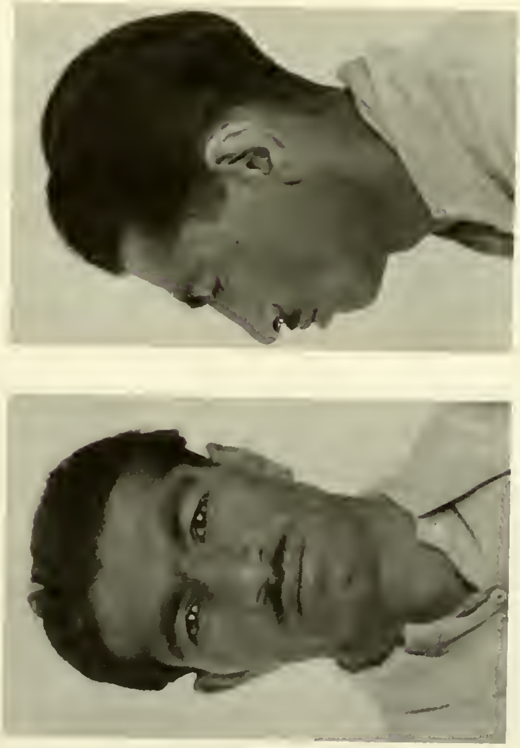
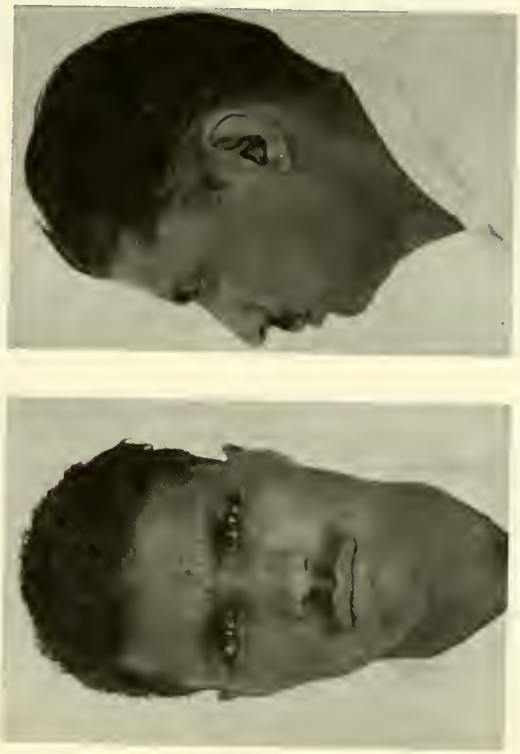
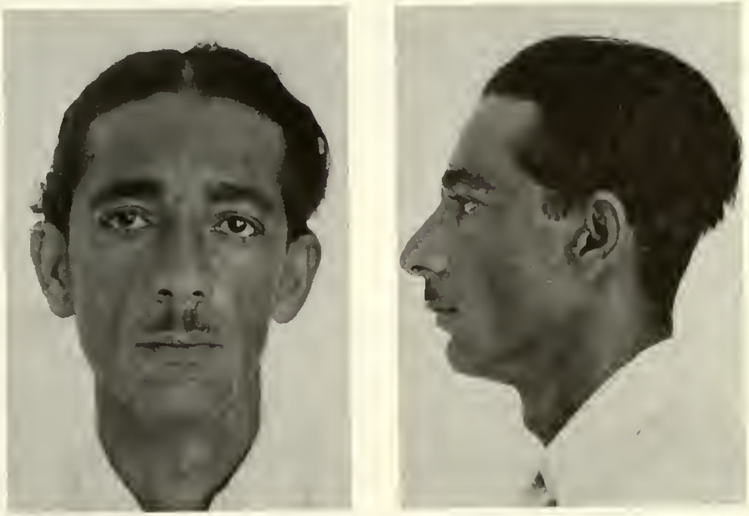


No. 66 (Age 25)

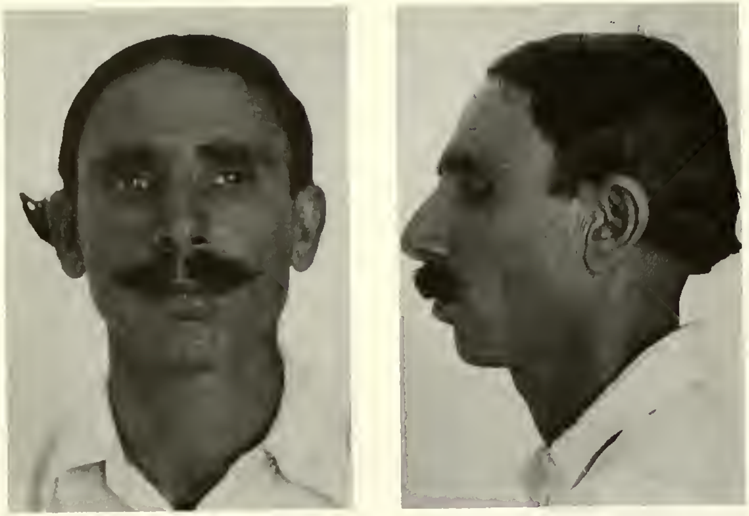


No. 101 (Age 25)

Brahuis at Panjgur.



No. 35 (Age 30)



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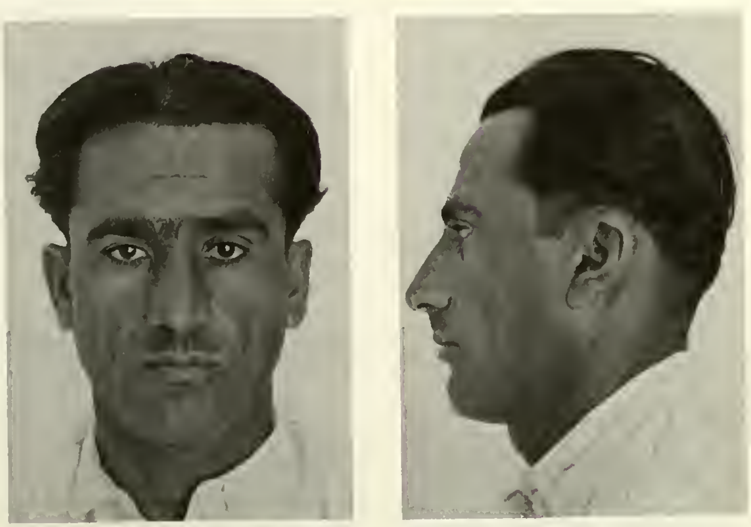

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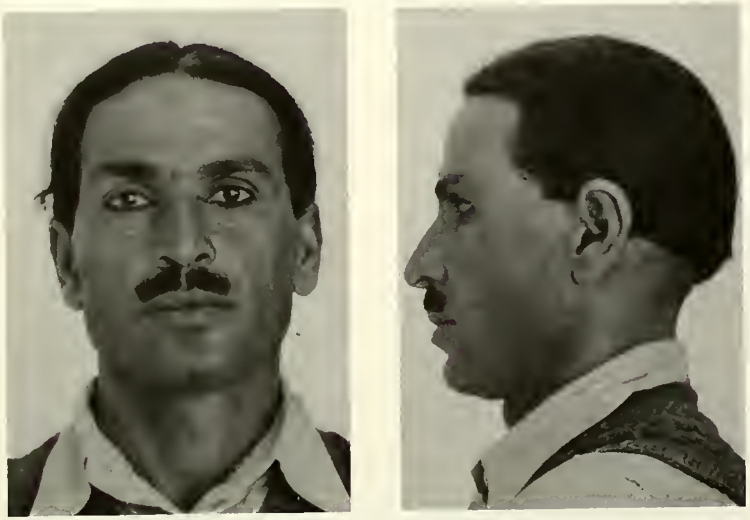

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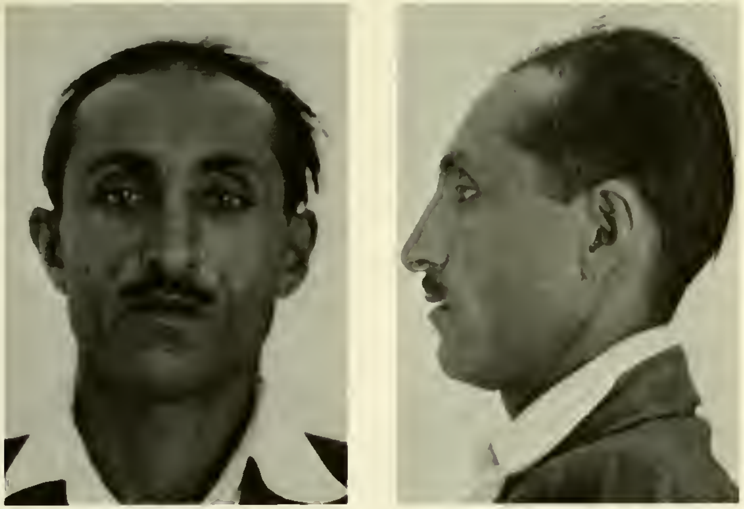
Brahuis at Panjgur.



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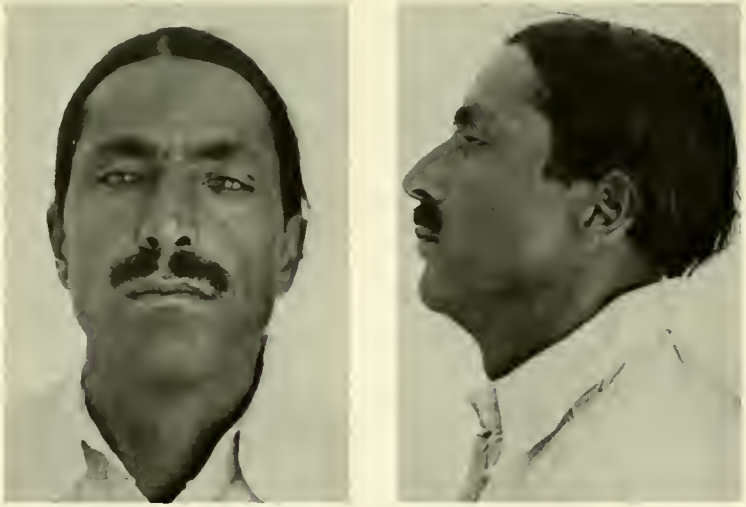
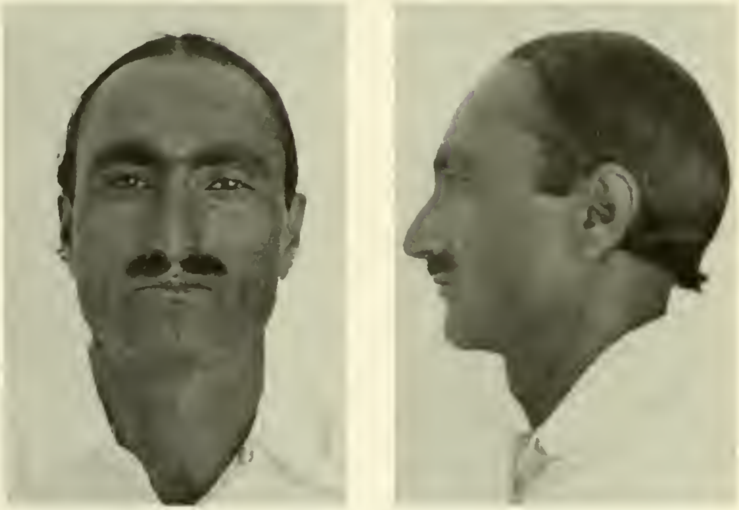
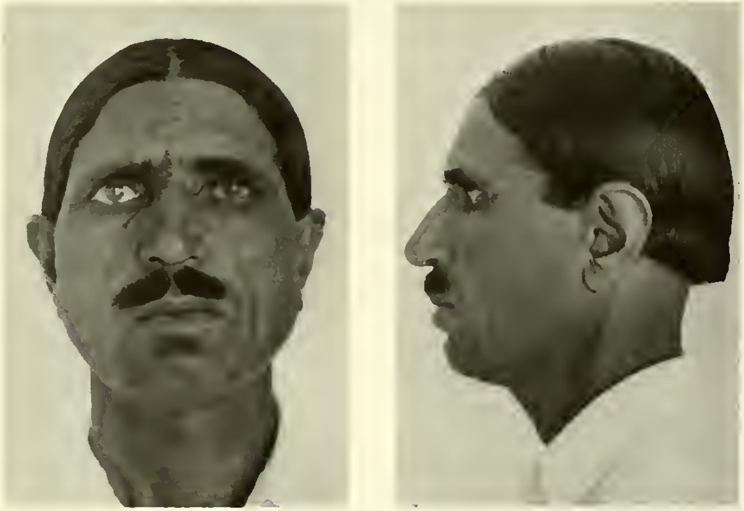


No. 95 (Age 30)

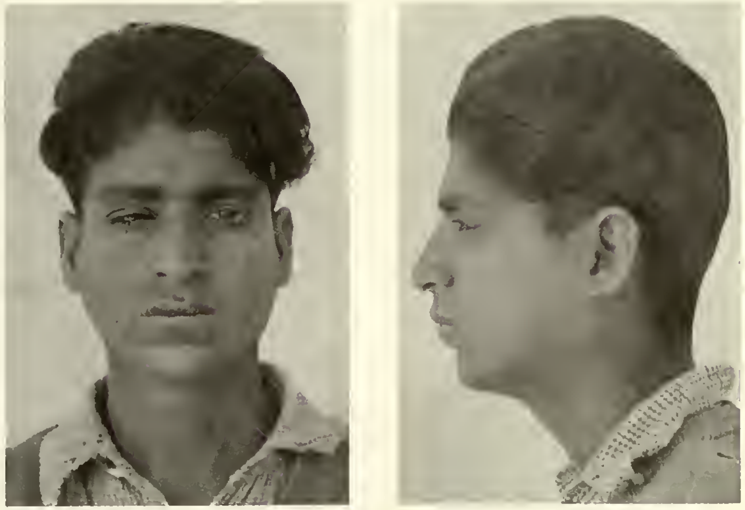


No. 38 (Age 32)

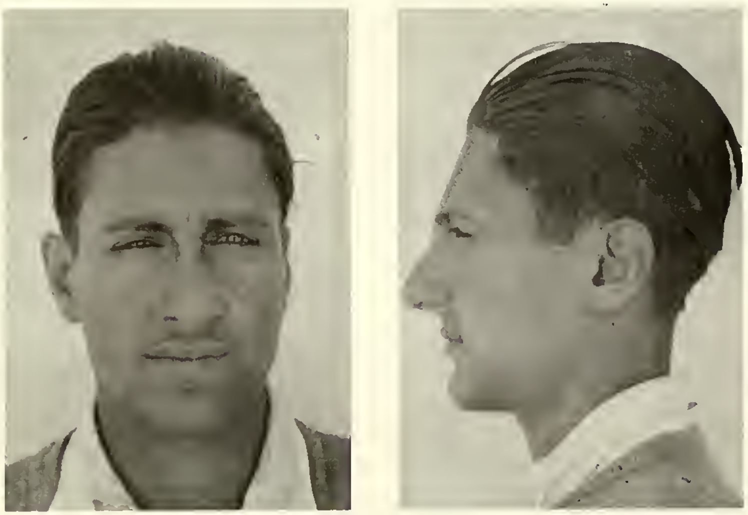


No. 36 (Age 36)

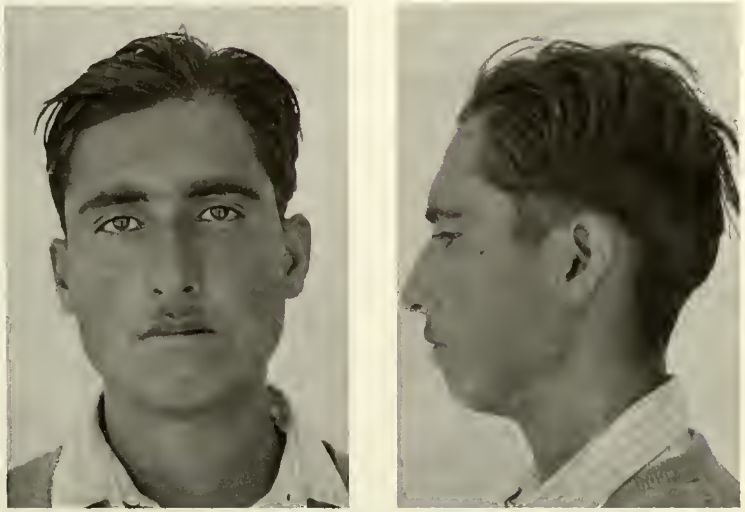
Brahuis at Panjgur.



No. 93 (Age 18)



No. 49 (Age 18)



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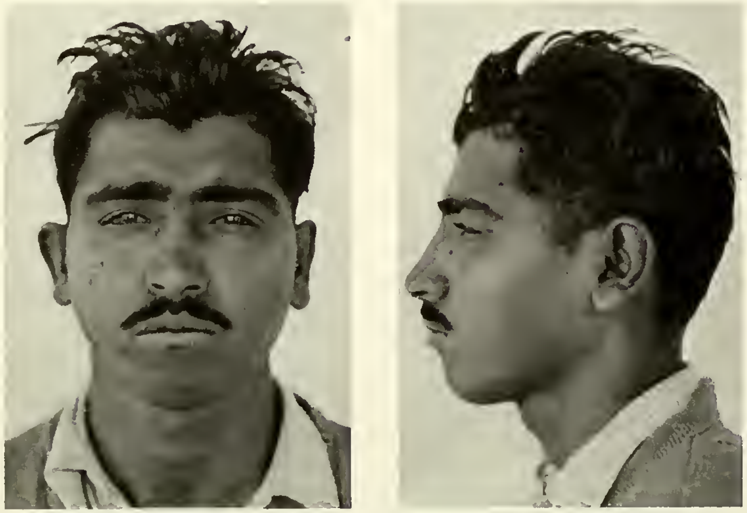
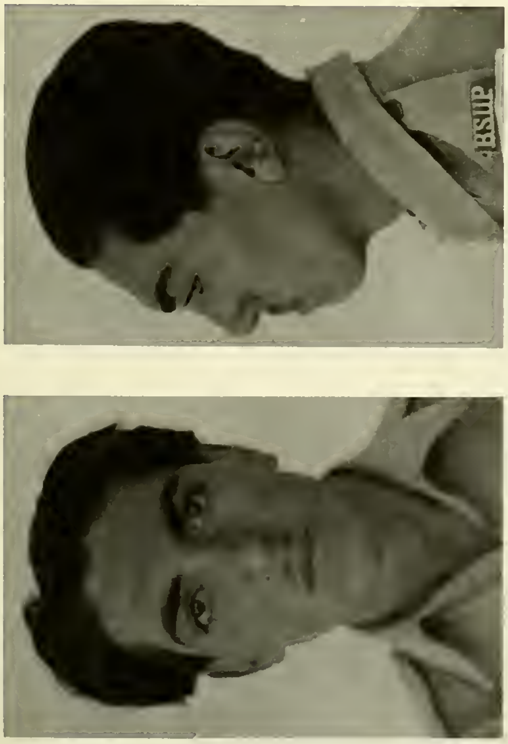
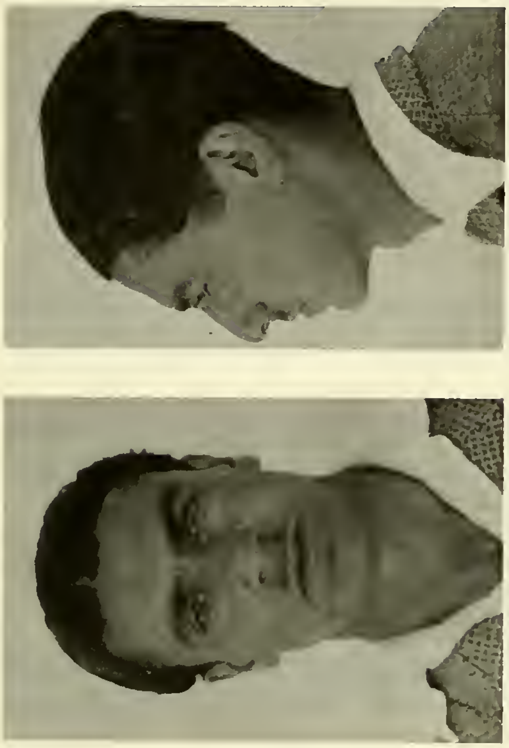


No. 132 (Age 18)

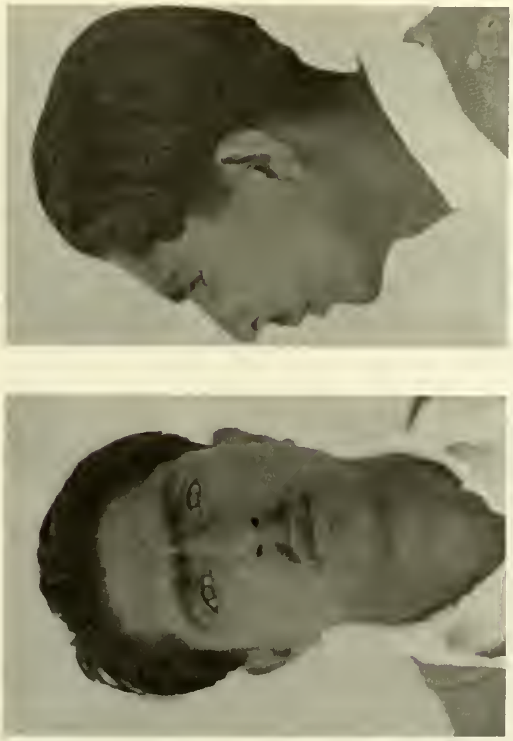
Brahuis at Kalat.



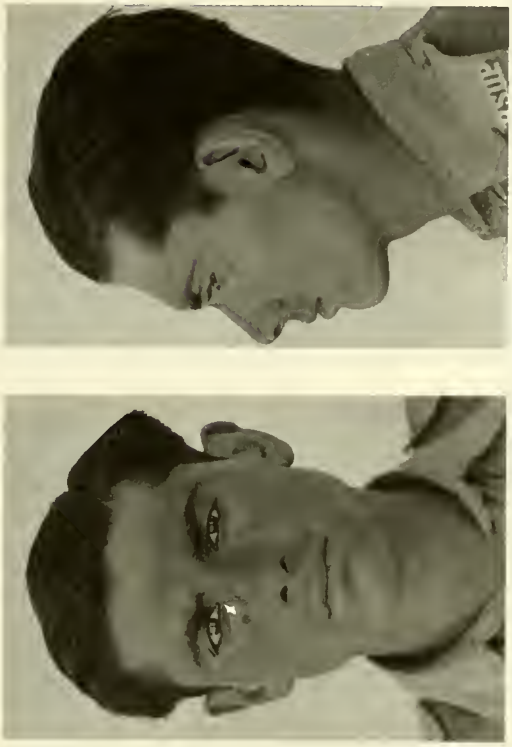
No. 96 (Age 19)



No. 63 (Age 19)

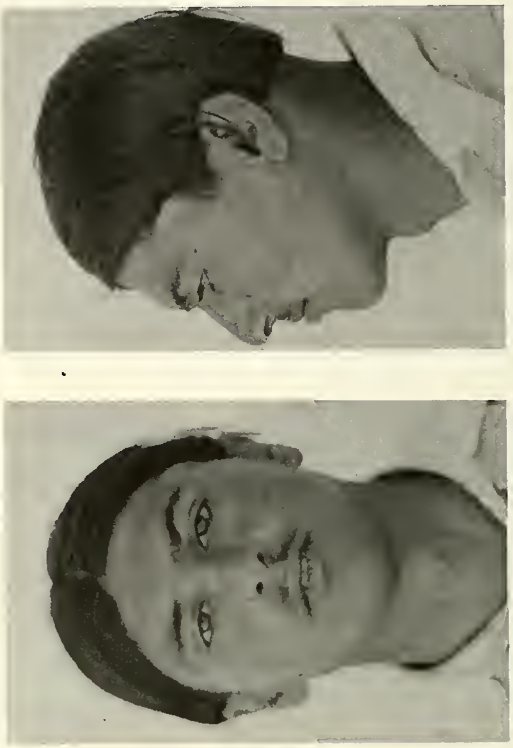


No. 51 (Age 19)

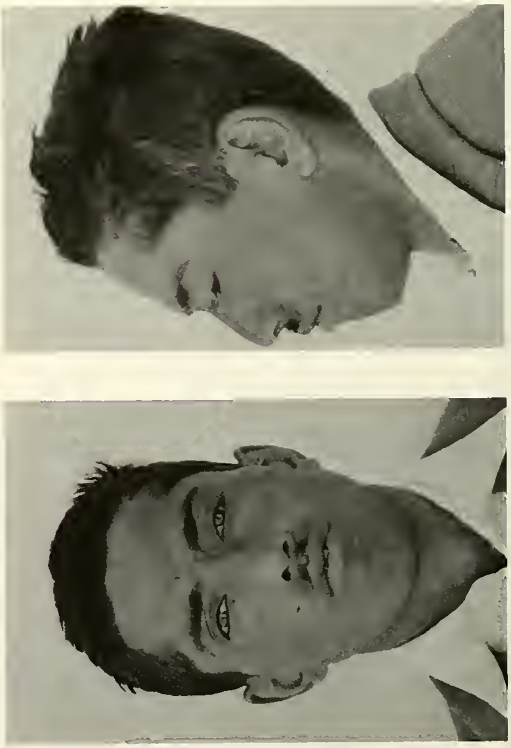


No. 92 (Age 20)

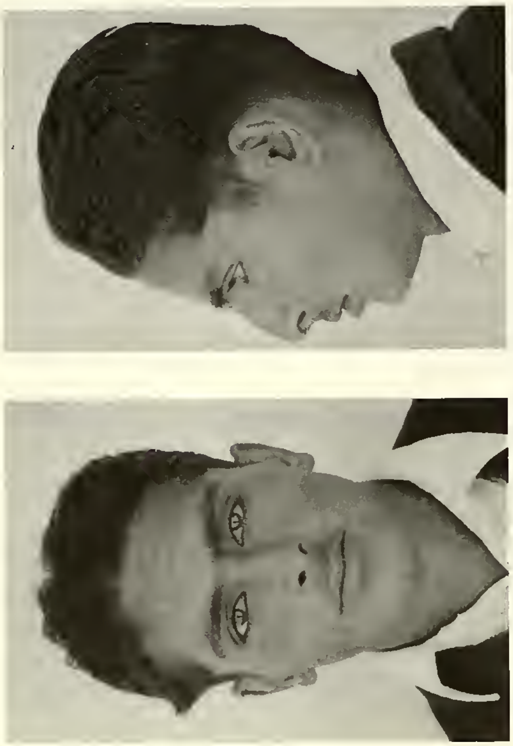
Brahuis at Kalat.



No. 41 (Age 20)



No. 40 (Age 20)



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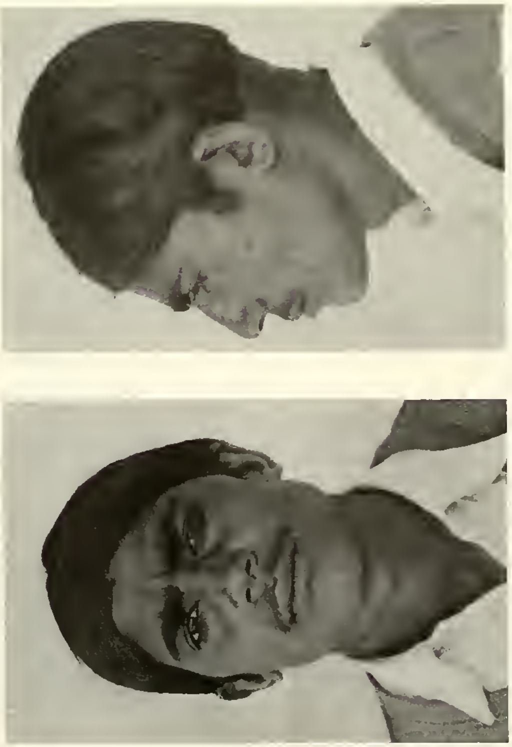
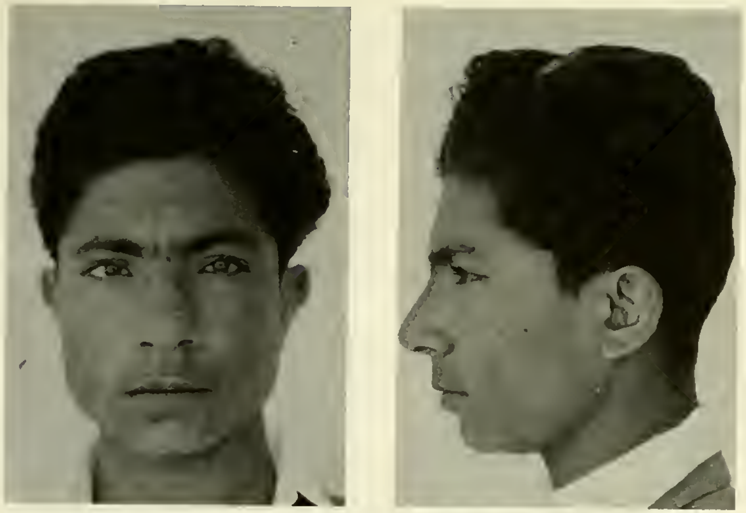
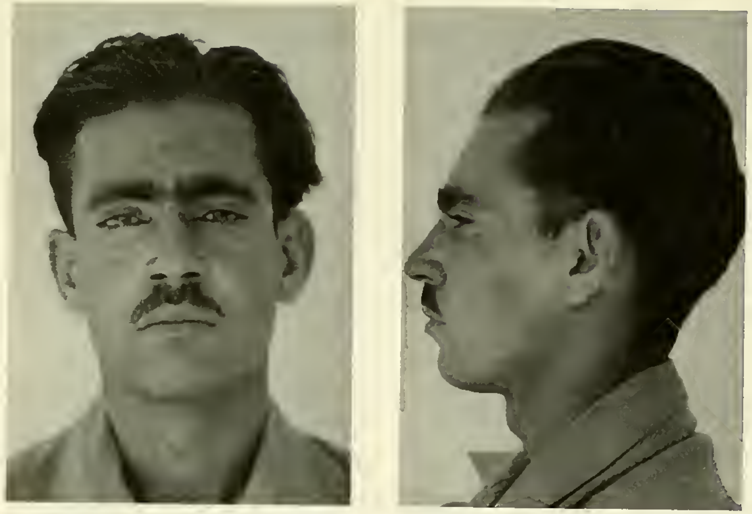


No. 72 (Age 20)

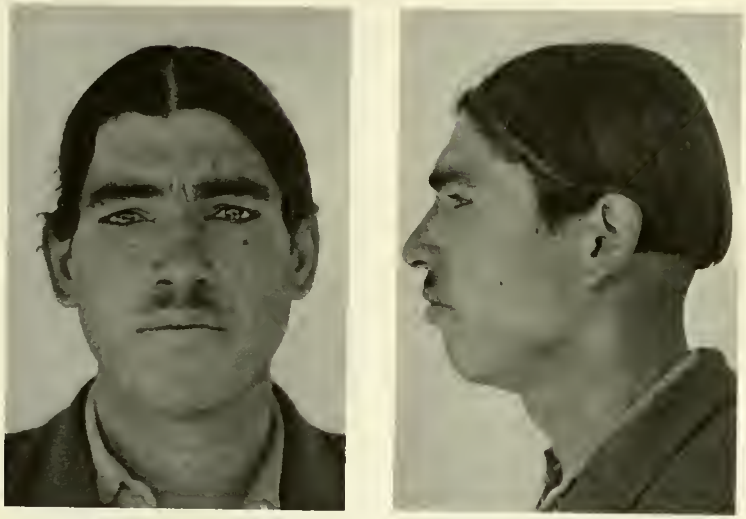
Brahuis at Kalat.



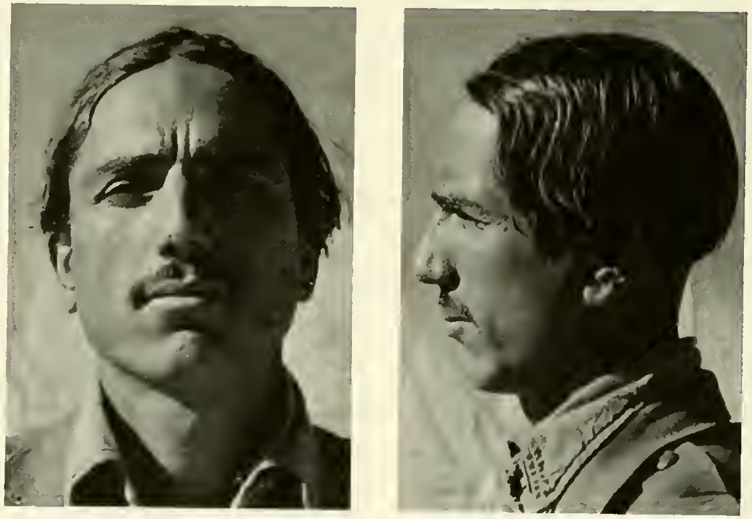
No. 38 (Age 20)



No. 25 (Age 20)

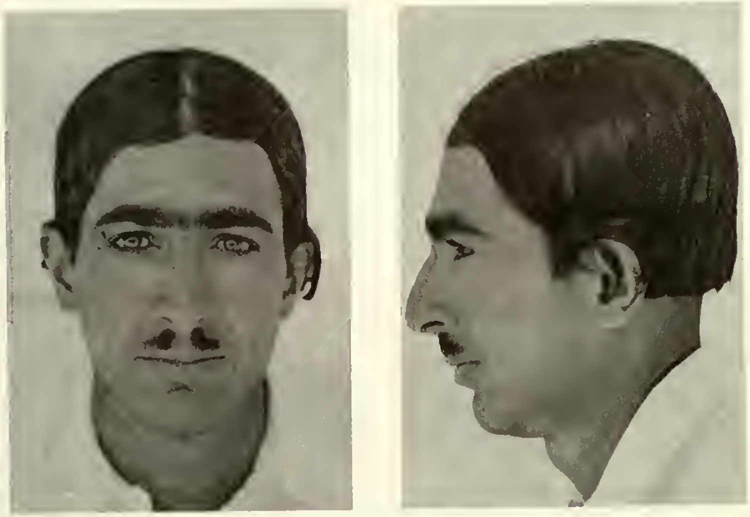


No. 23 (Age 20)

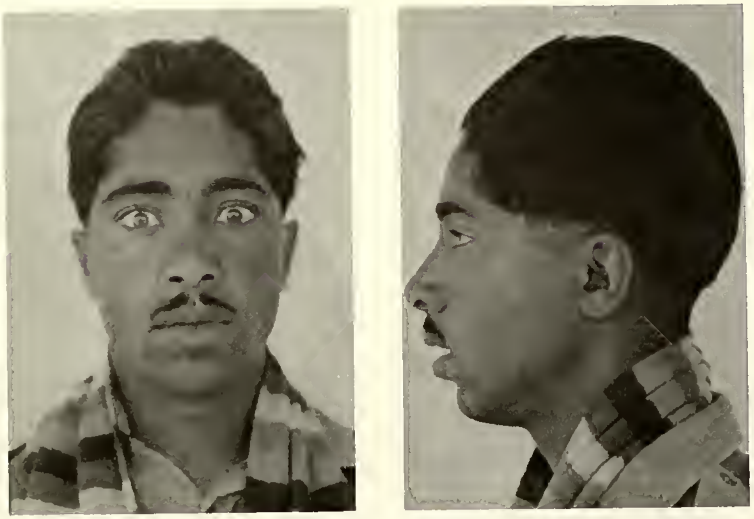


No. 4 (Age 20)

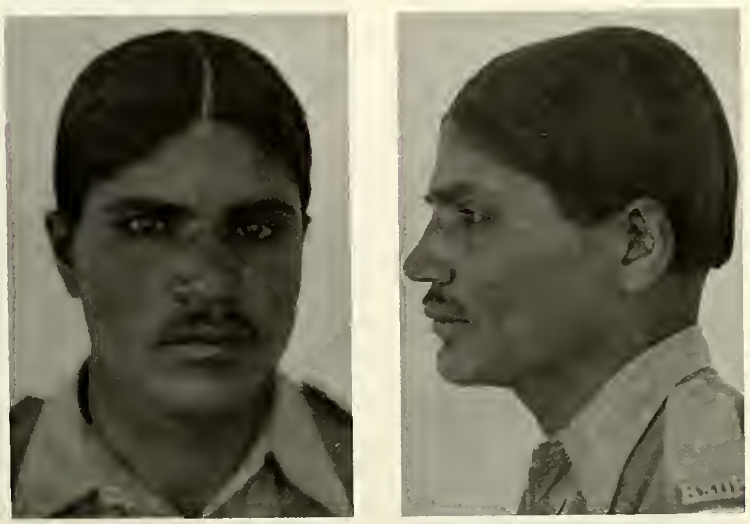
Brahuis at Kalat.



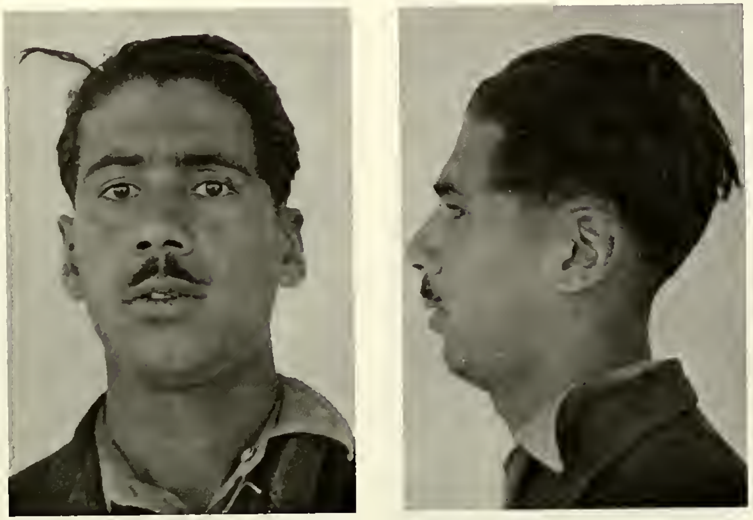
No. 20 (Age 21)



No. 68 (Age 21)

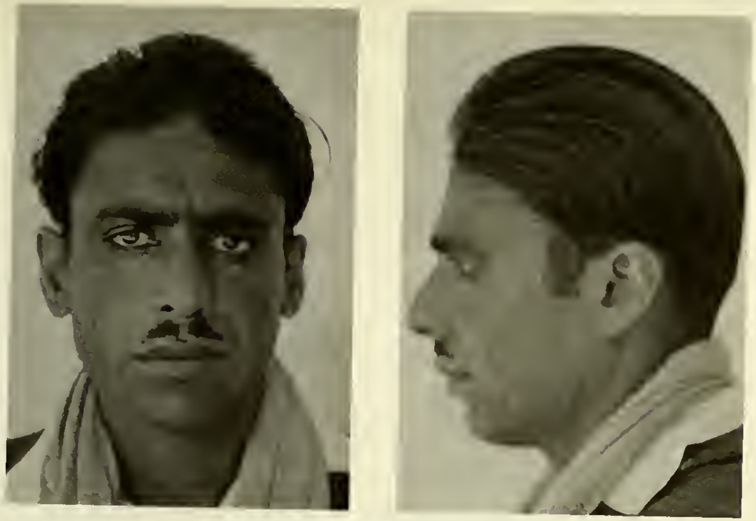


No. 91 (Age 22)

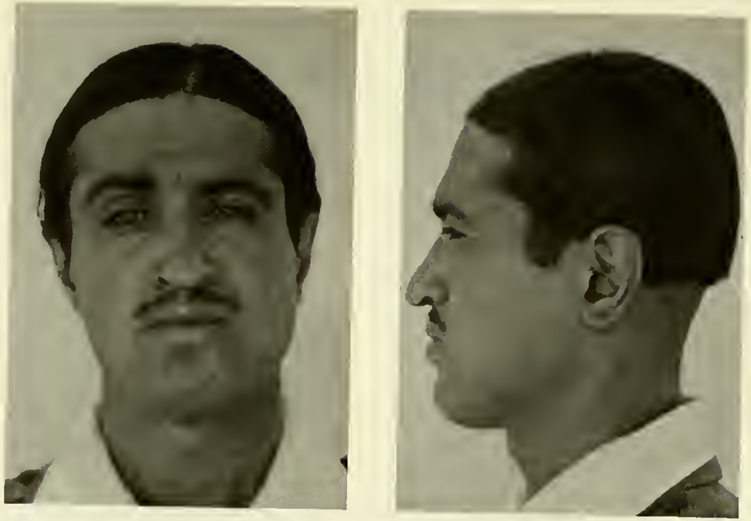


No. 60 (Age 22)

Brahuis at Kalat.



No. 33 (Age 22)



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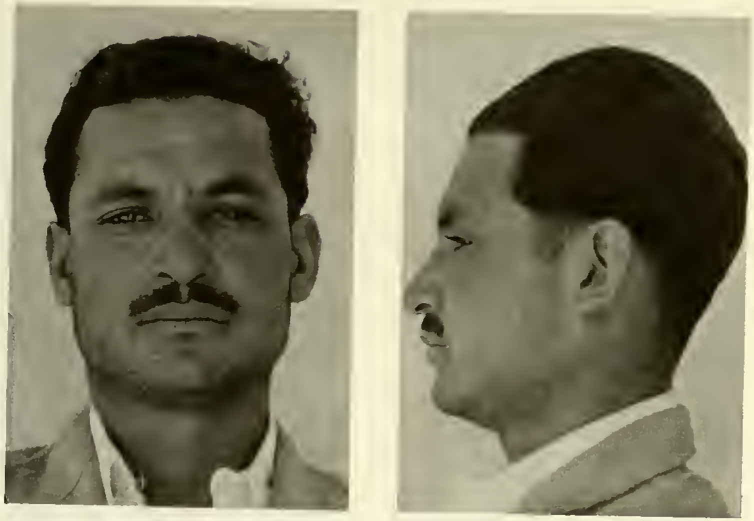
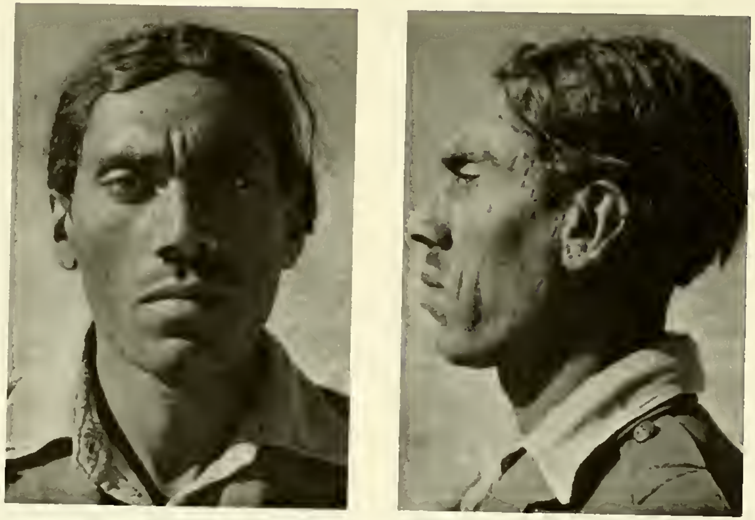
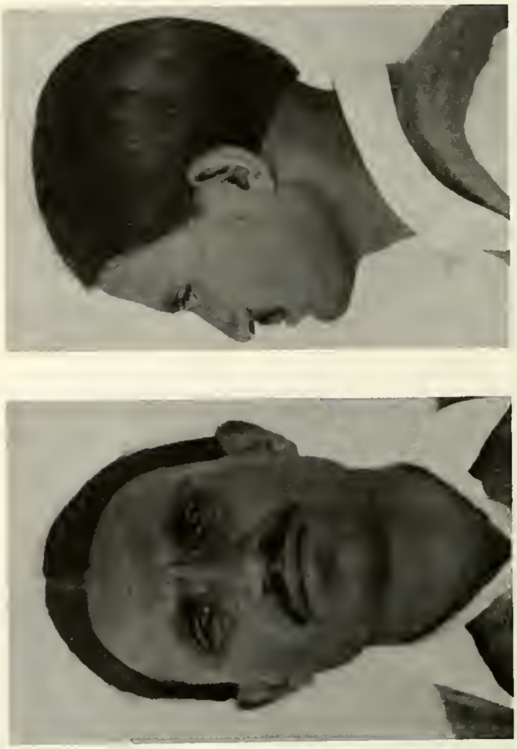


No. 34 (Age 25)

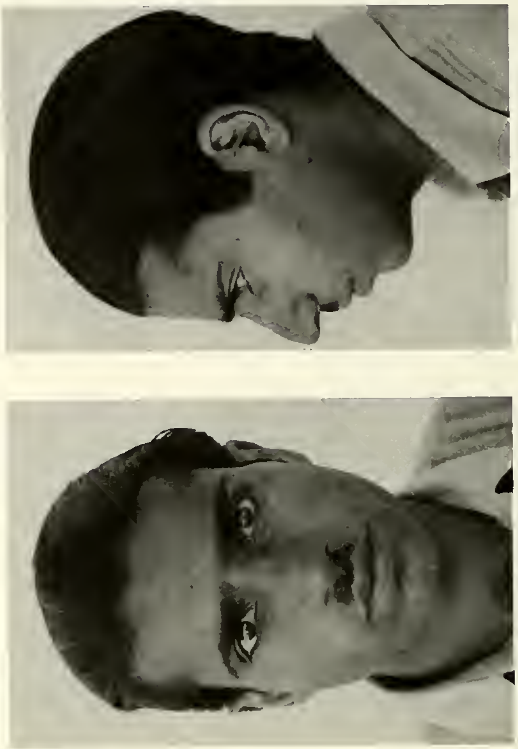


No. 3 (Age 25)

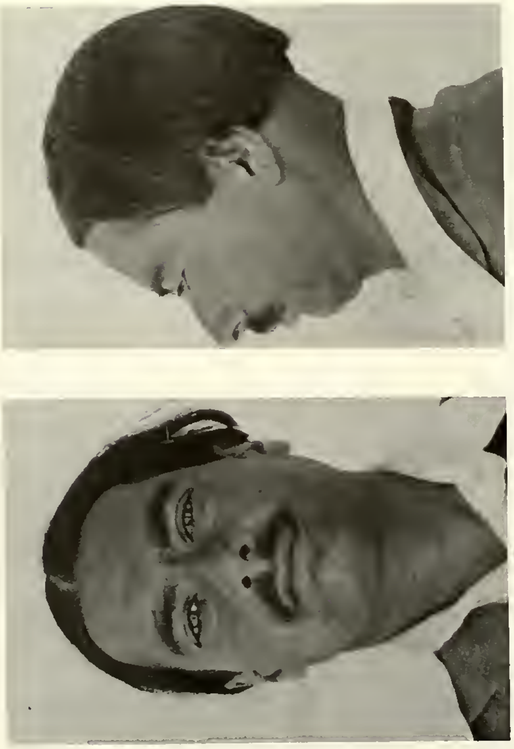
Brahuis at Kalat.



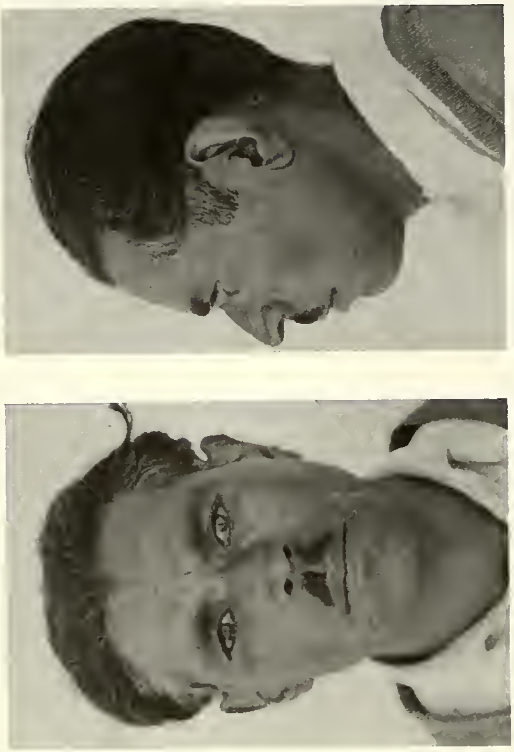
No. 67 (Age 25)



No. 128 (Age 25)

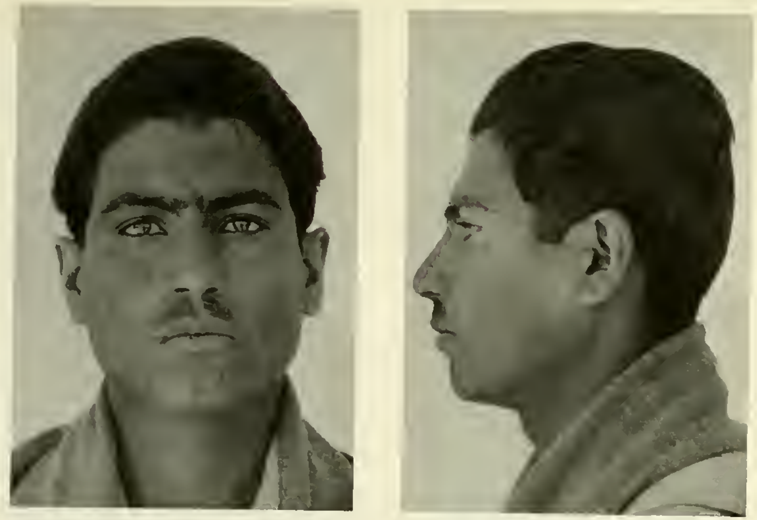


No. 39 (Age 25)

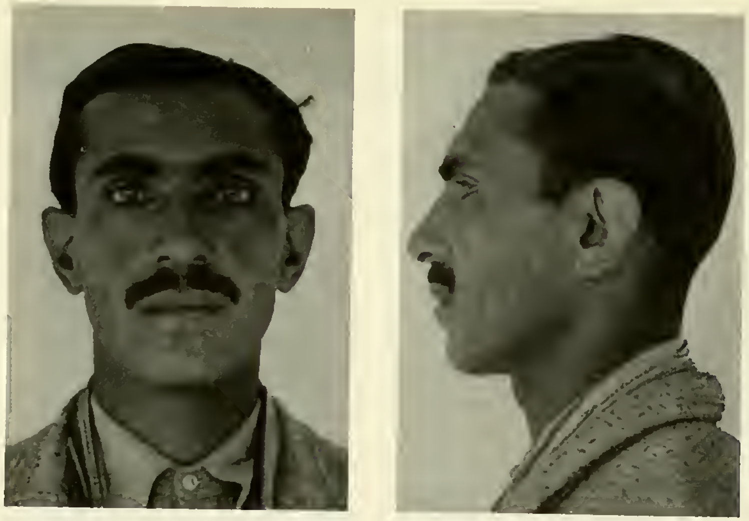


No. 57 (Age 25)

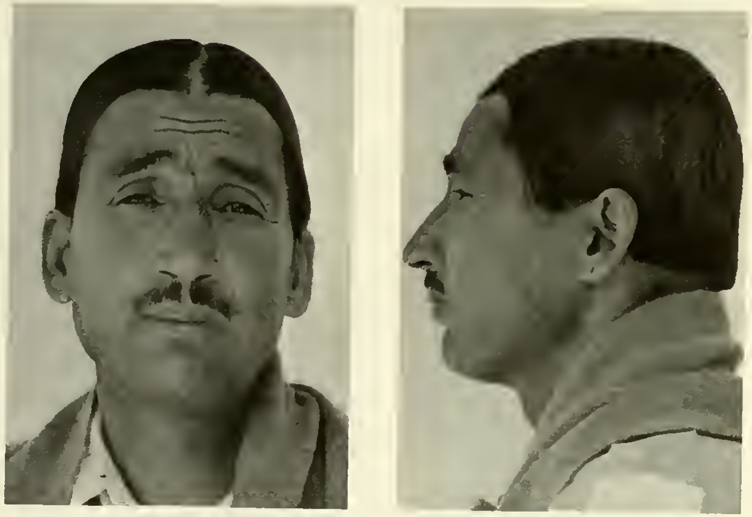
Brahuis at Kalat.



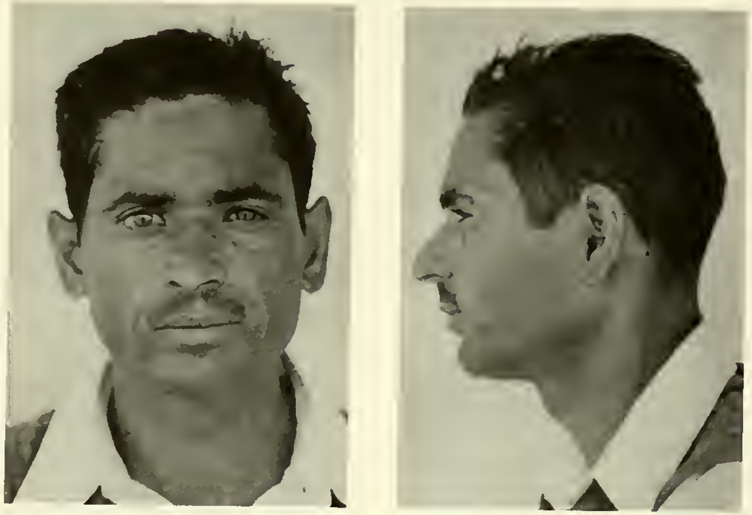
No. 24 (Age 26)



No. 16 (Age 27)

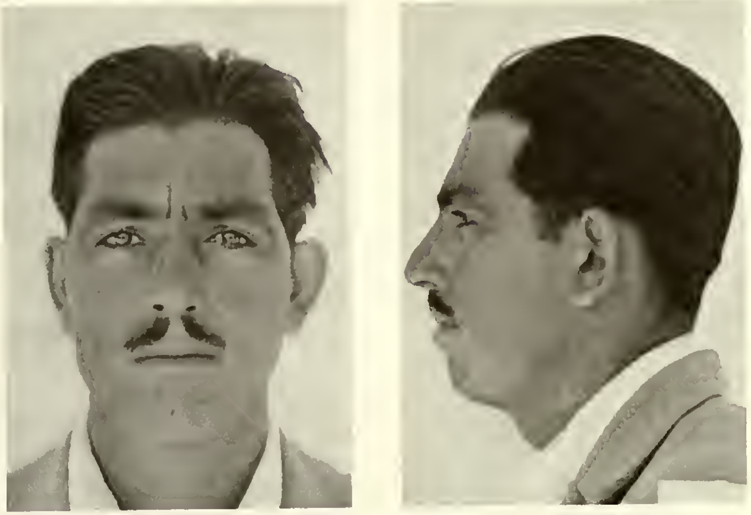


No. 19 (Age 27)

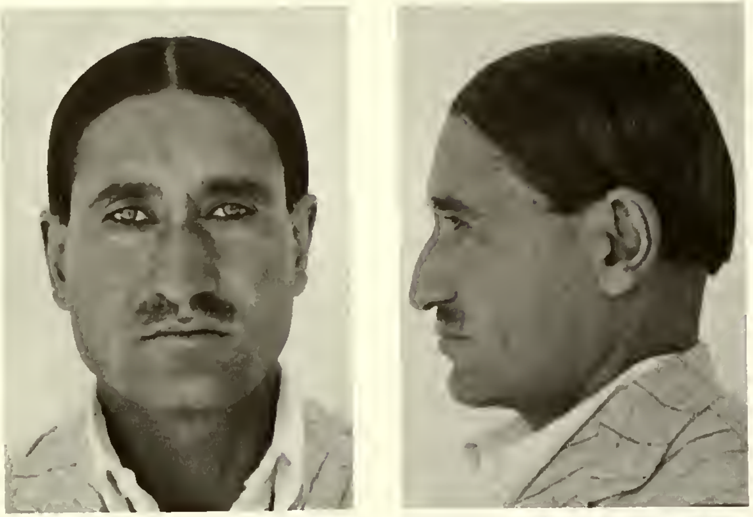


No. 64 (Age 27)

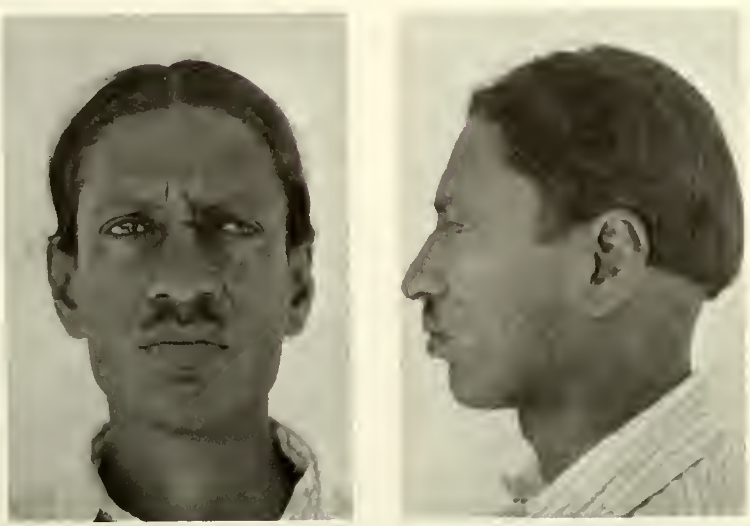
Brahuis at Kalat.



No. 21 (Age 28)



No. 27 (Age 28)



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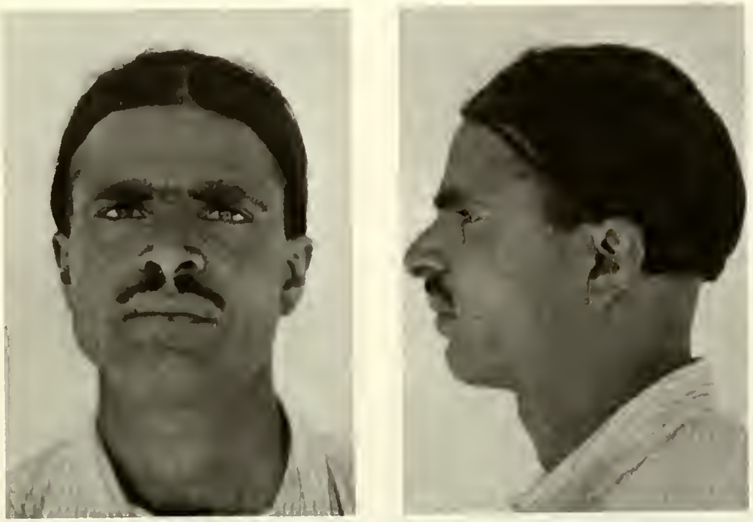

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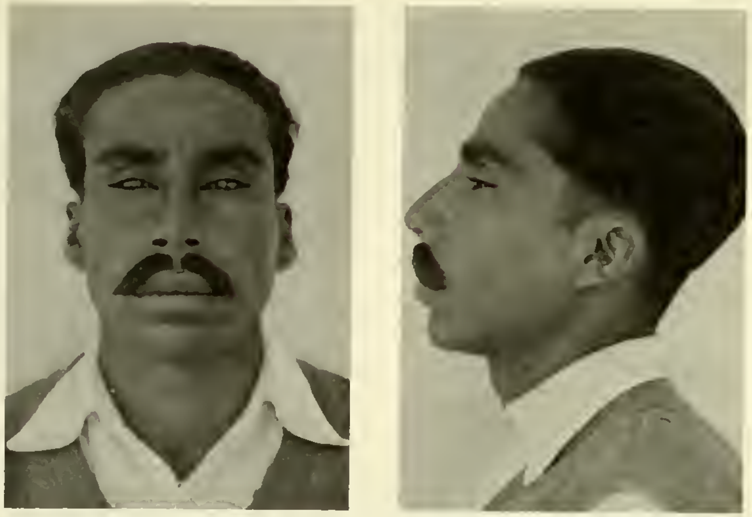

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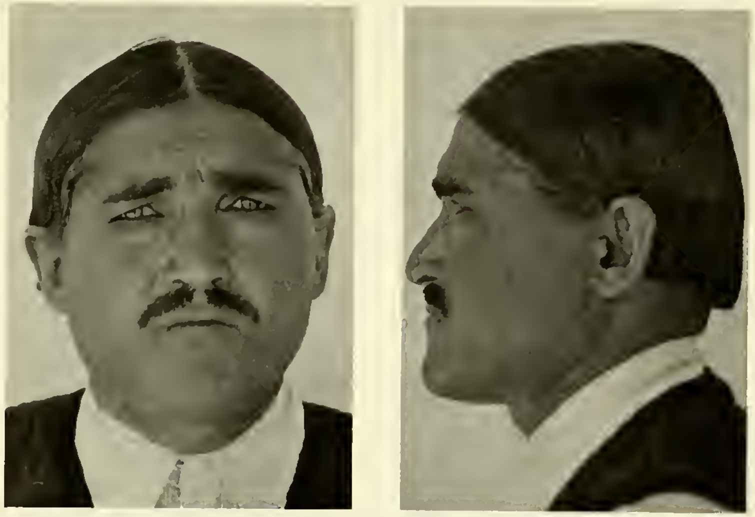

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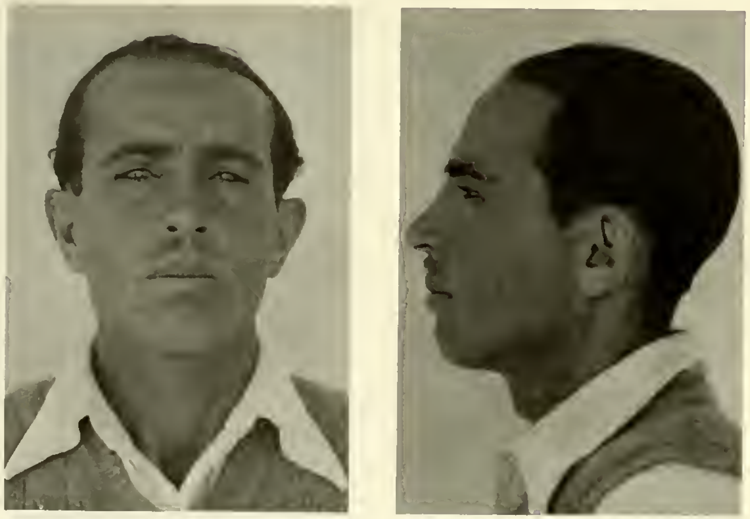

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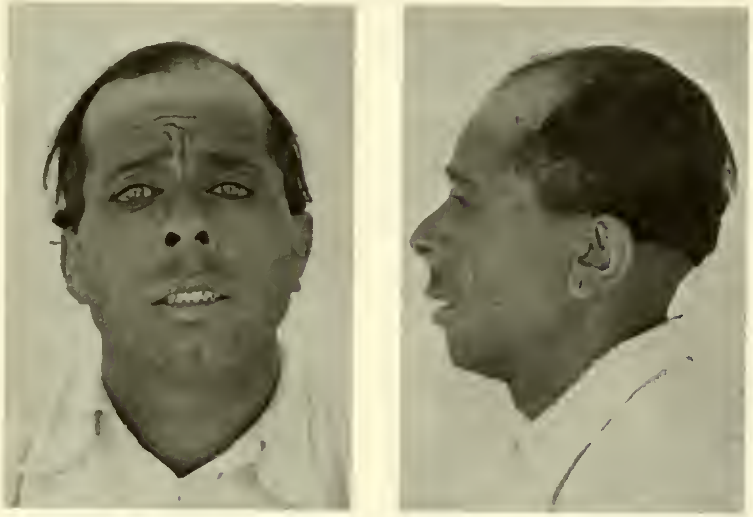

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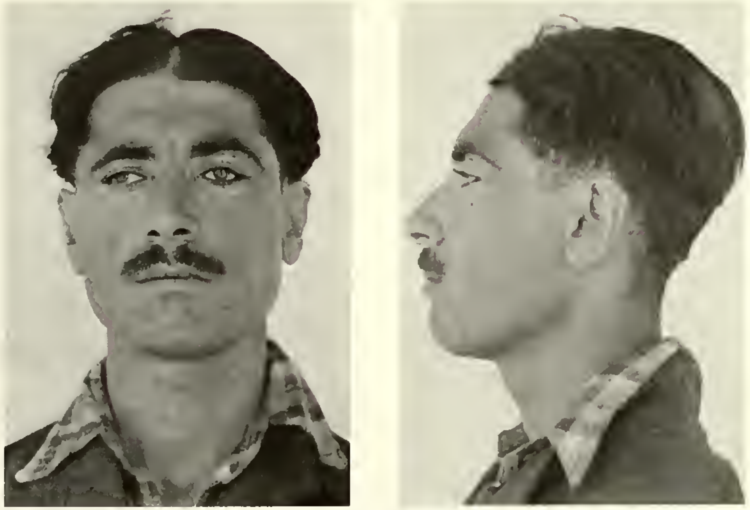

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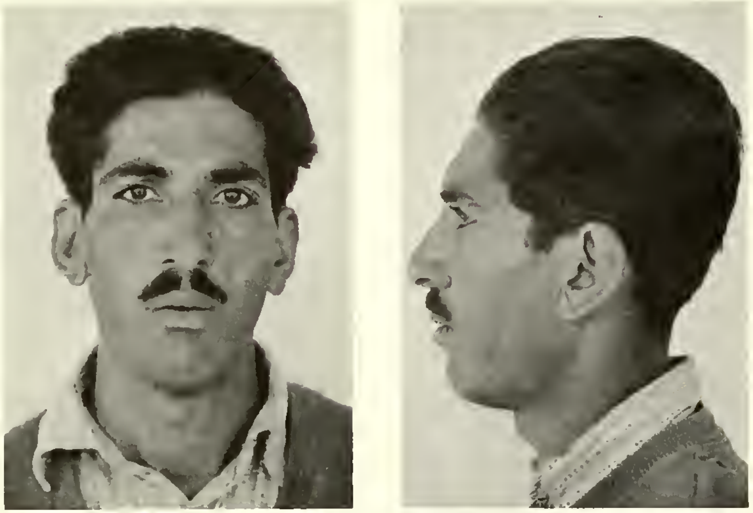

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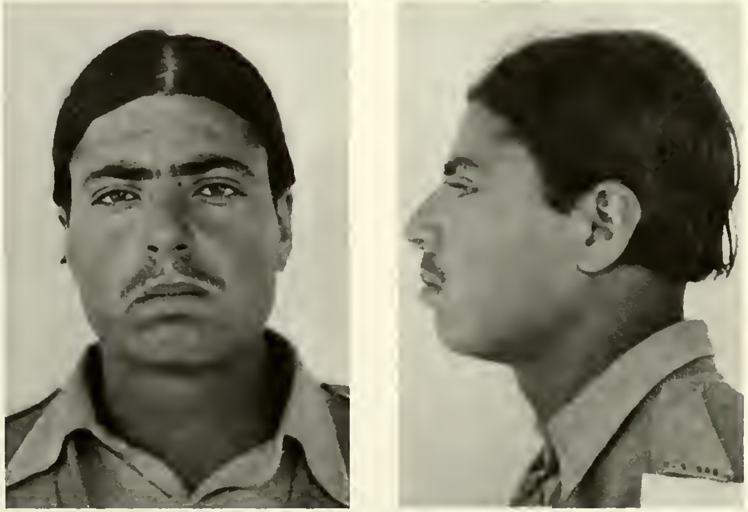

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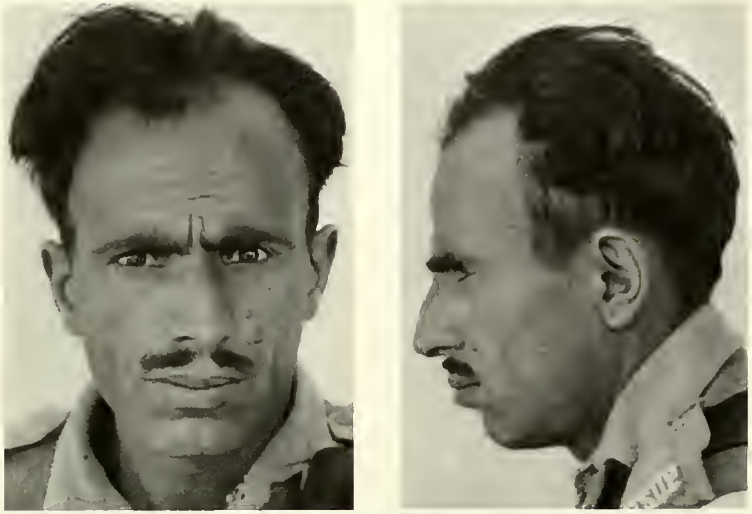

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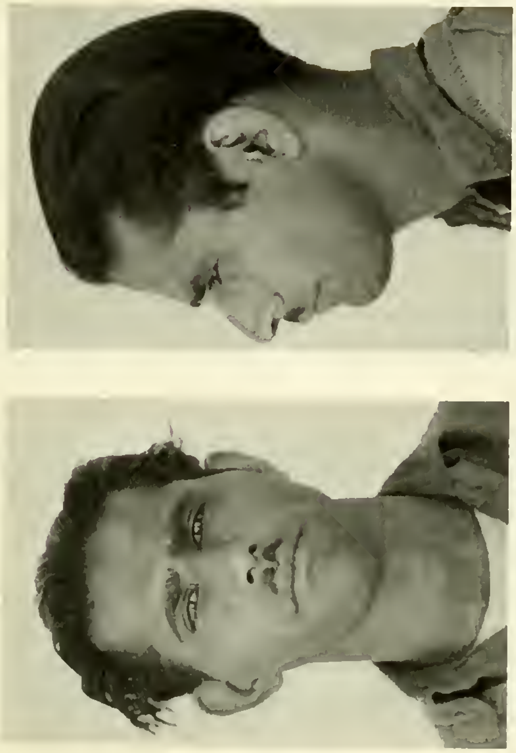

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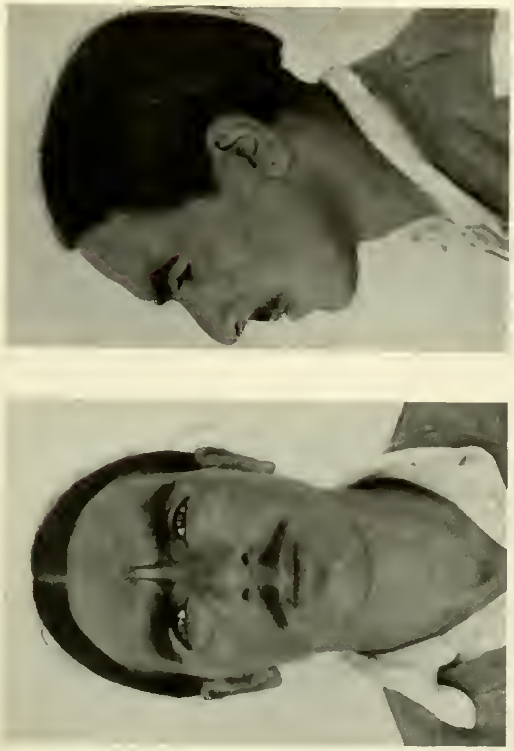

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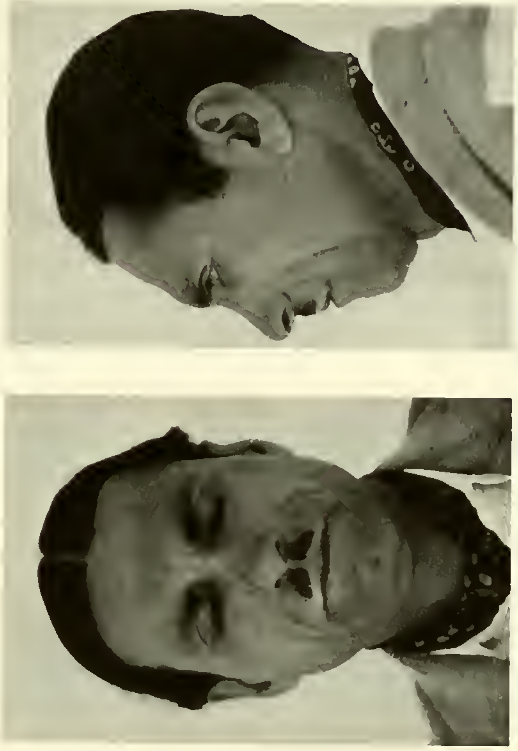

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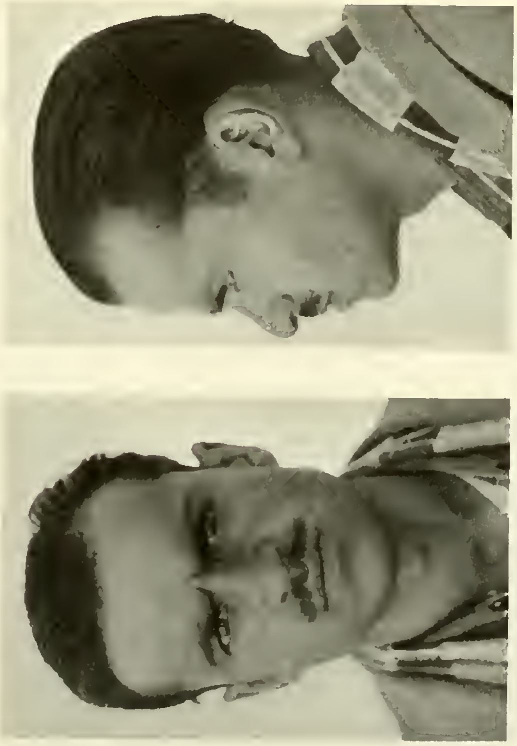

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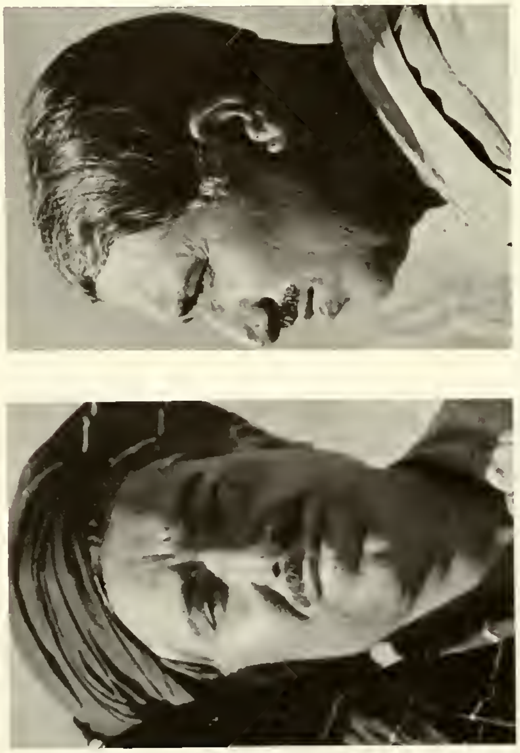

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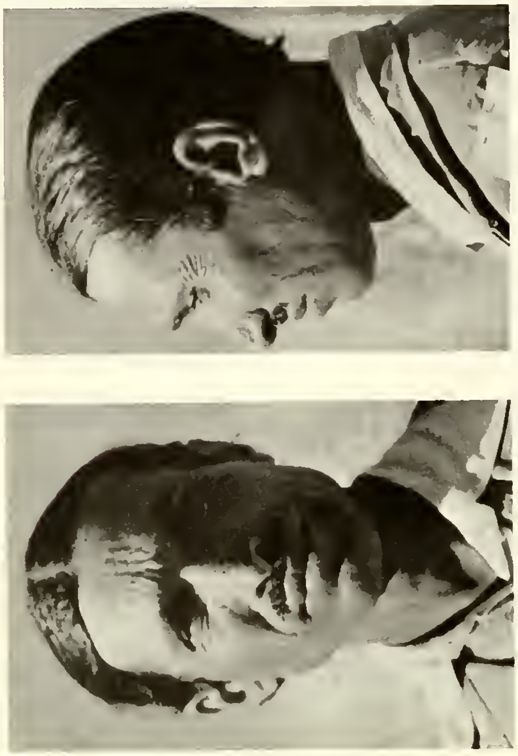

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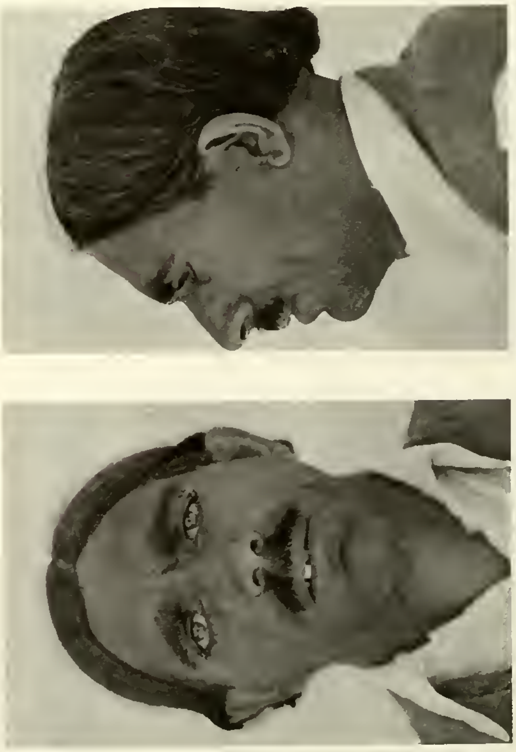

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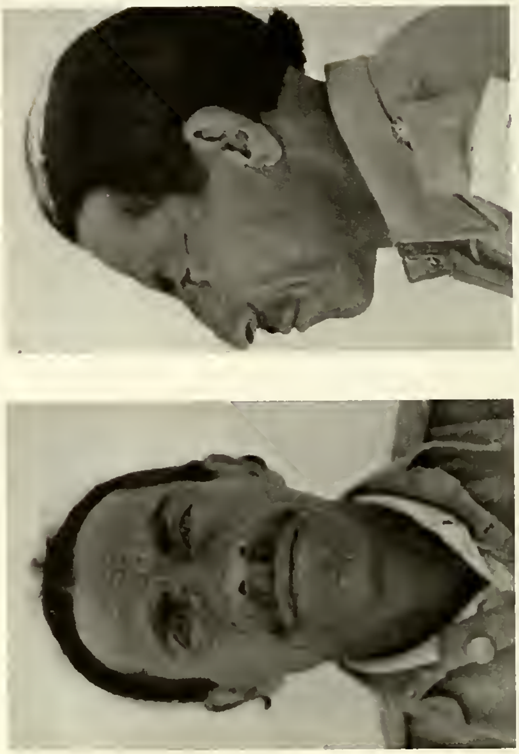

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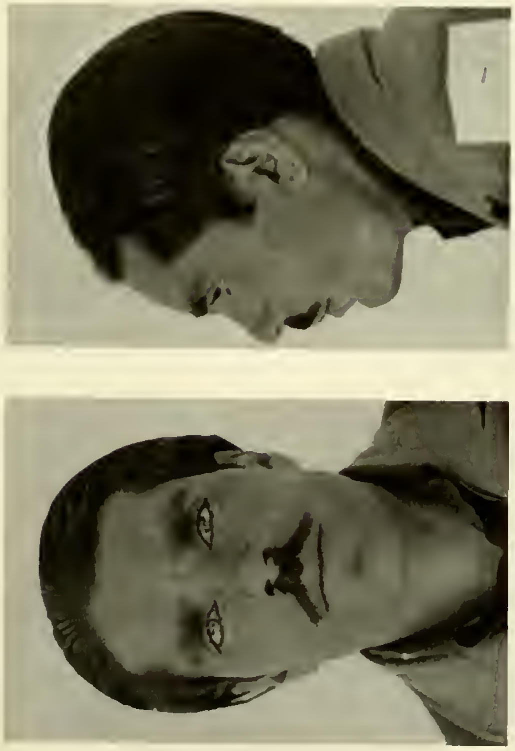

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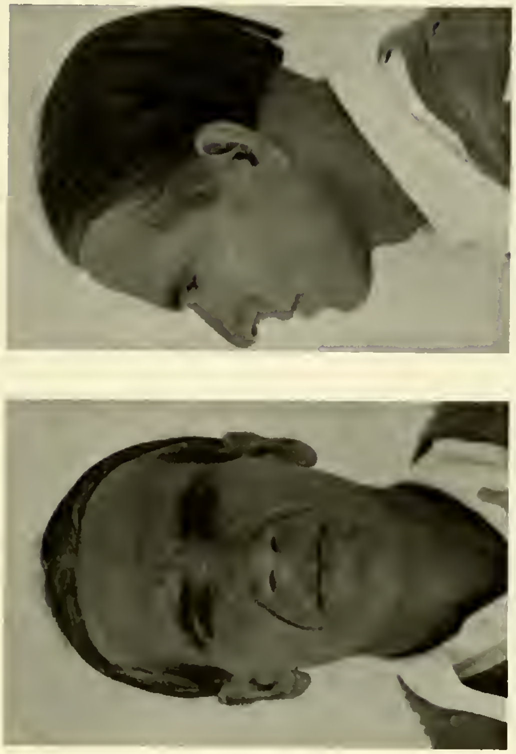

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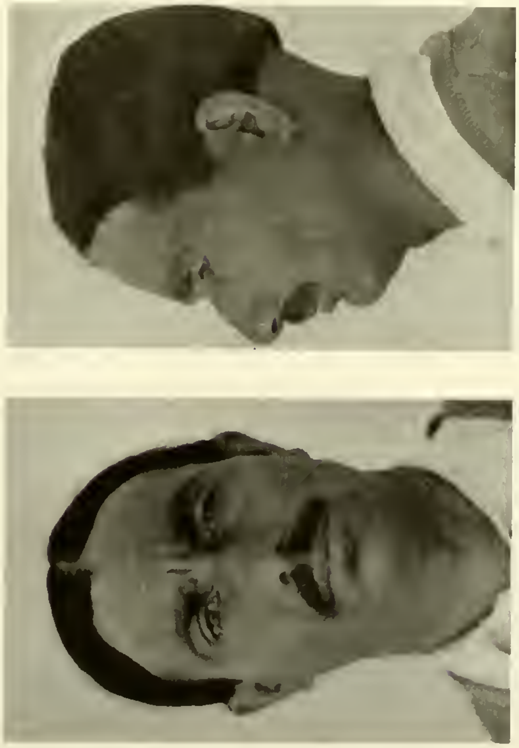

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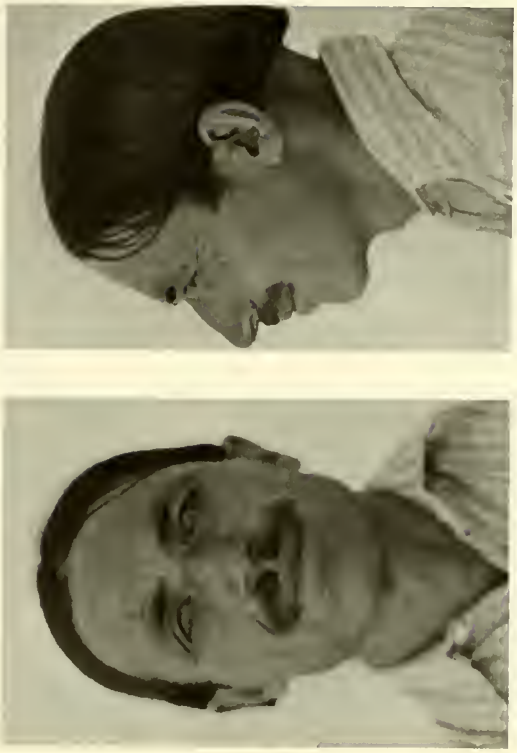

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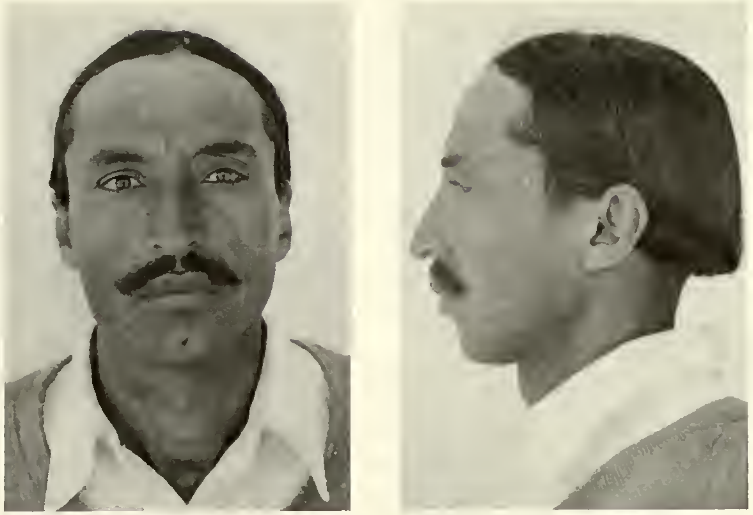

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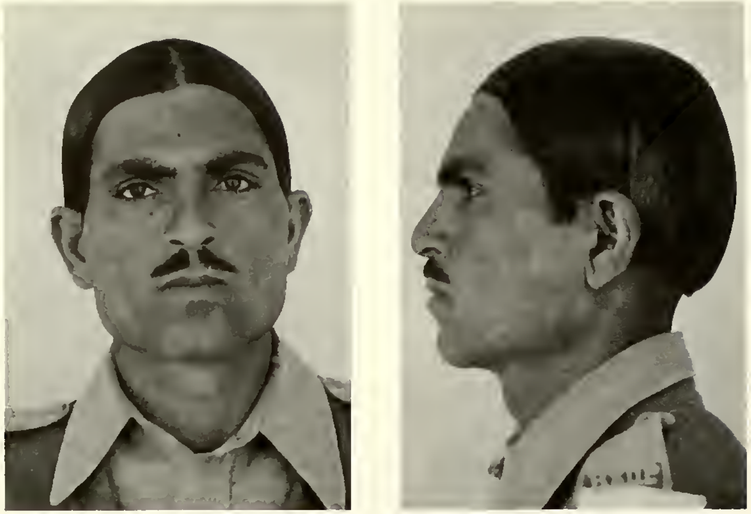

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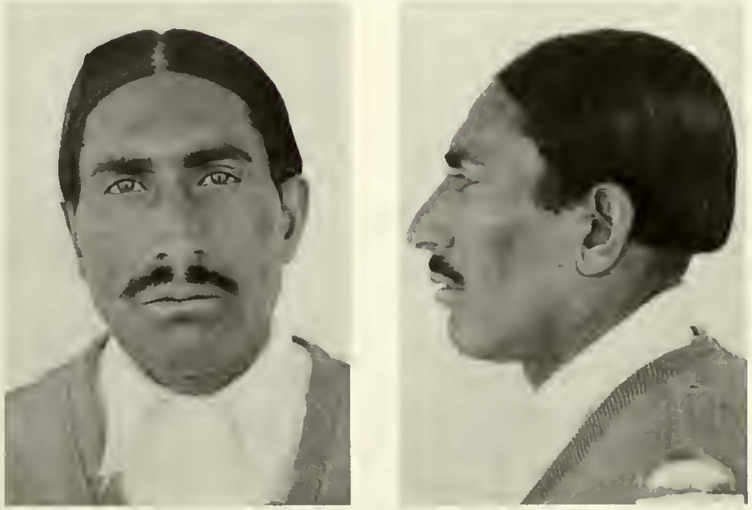

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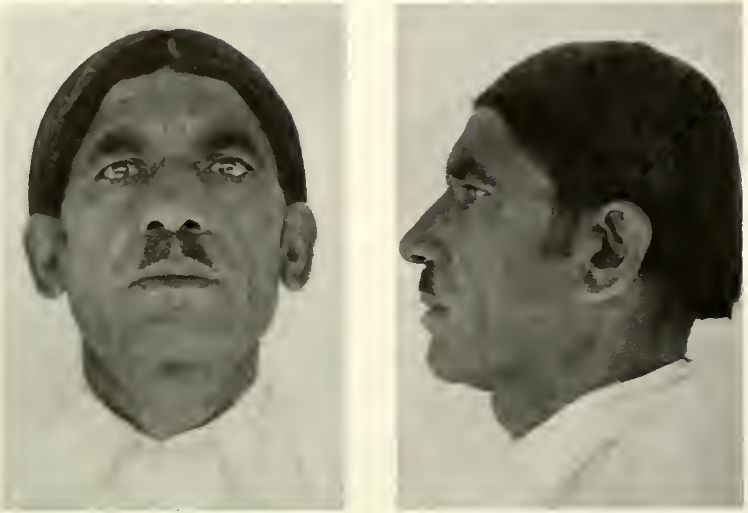

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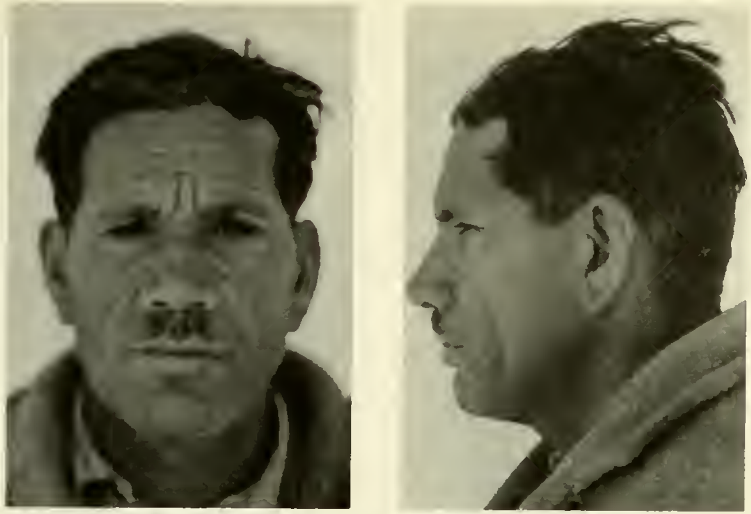

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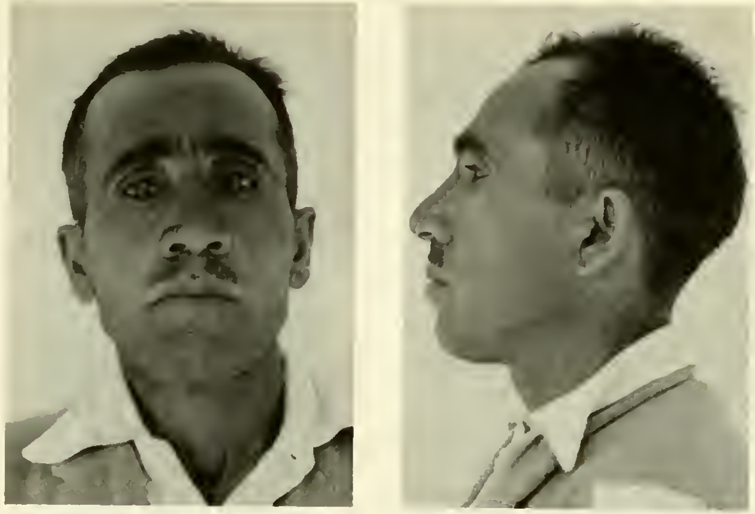

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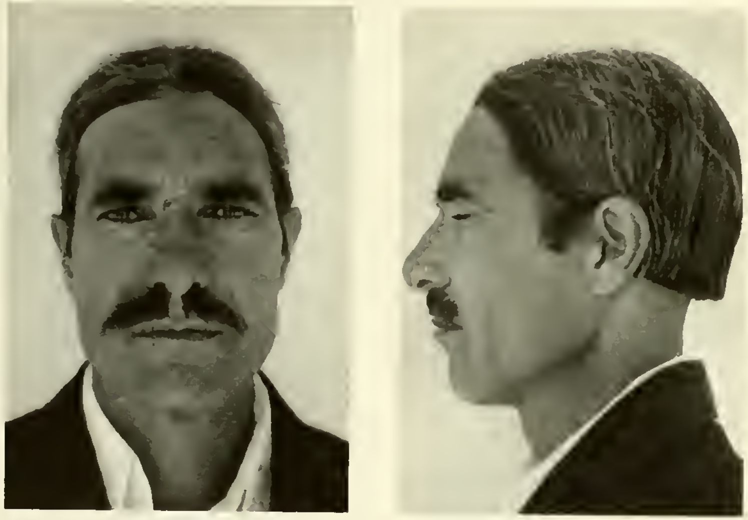

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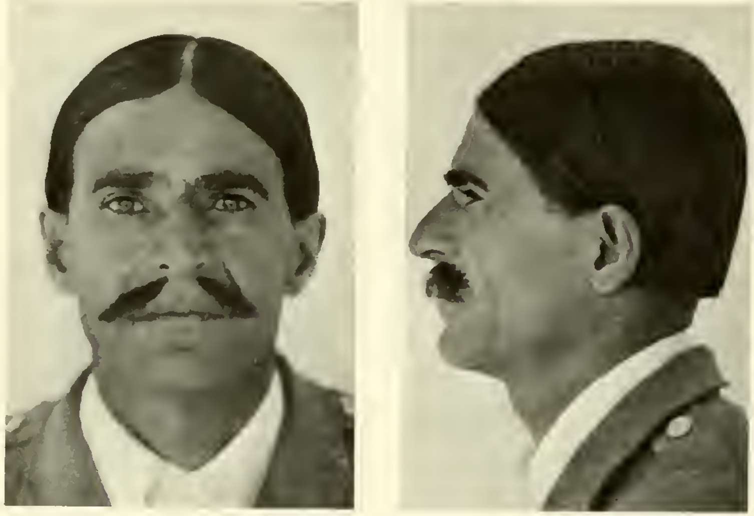

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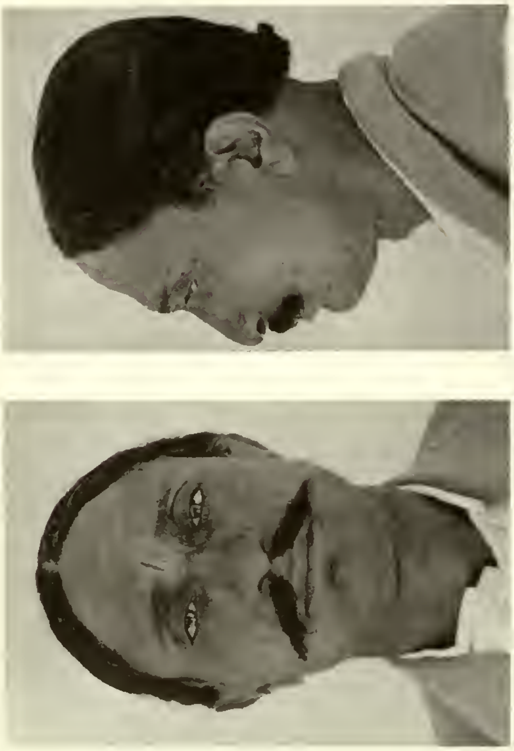

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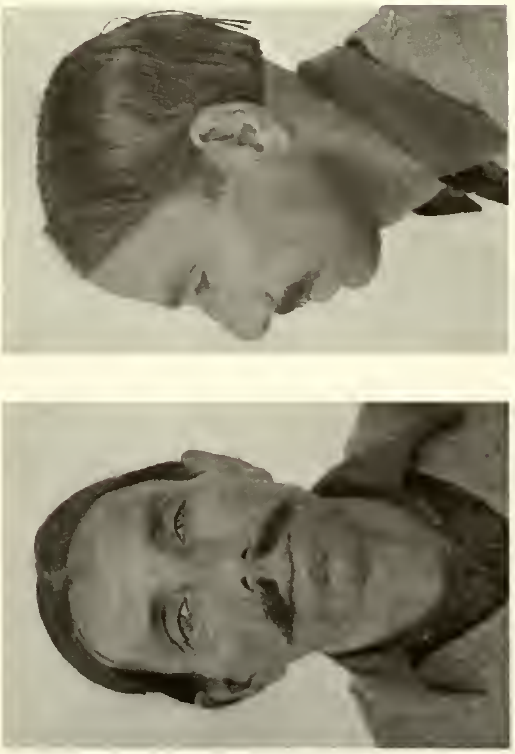

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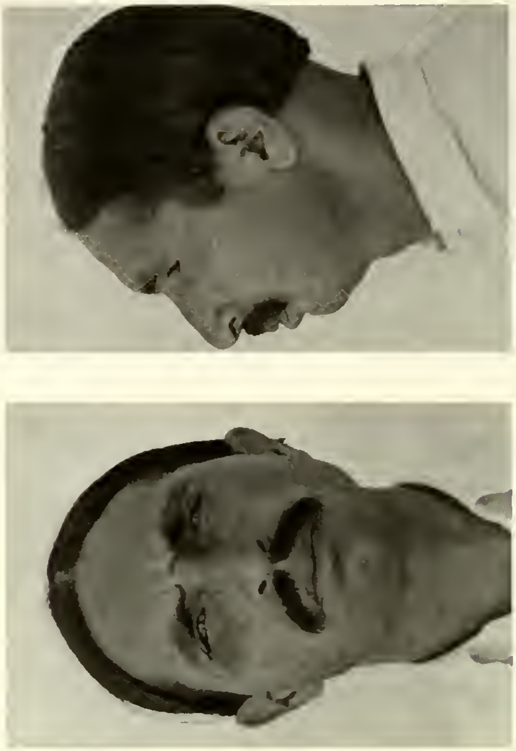

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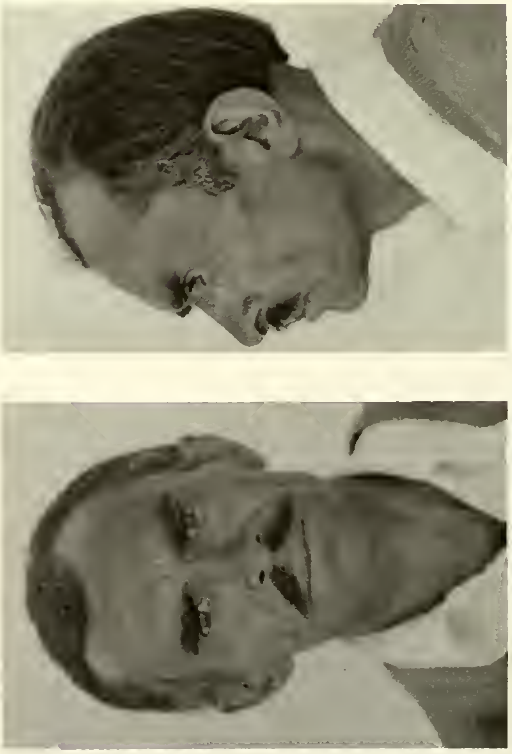

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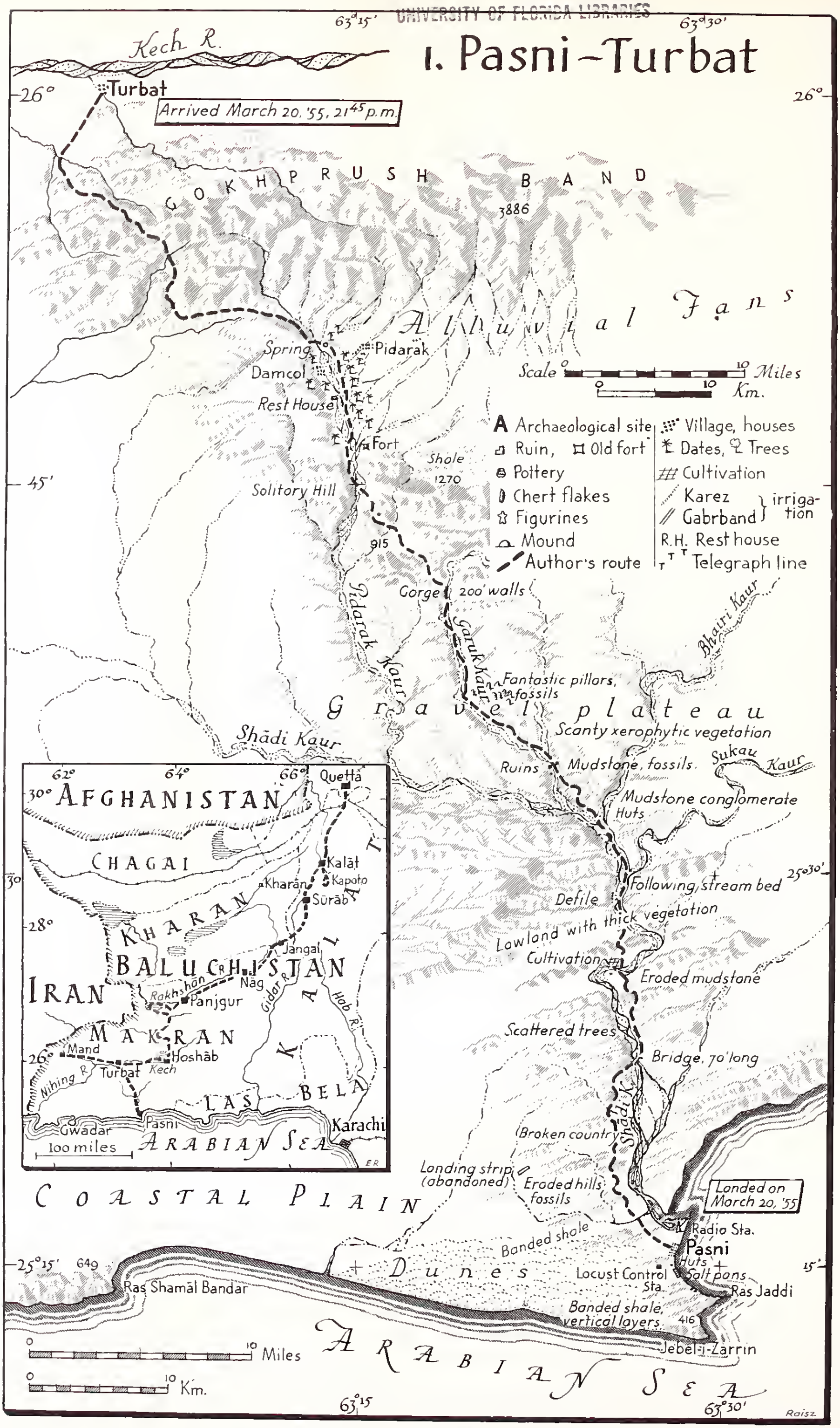

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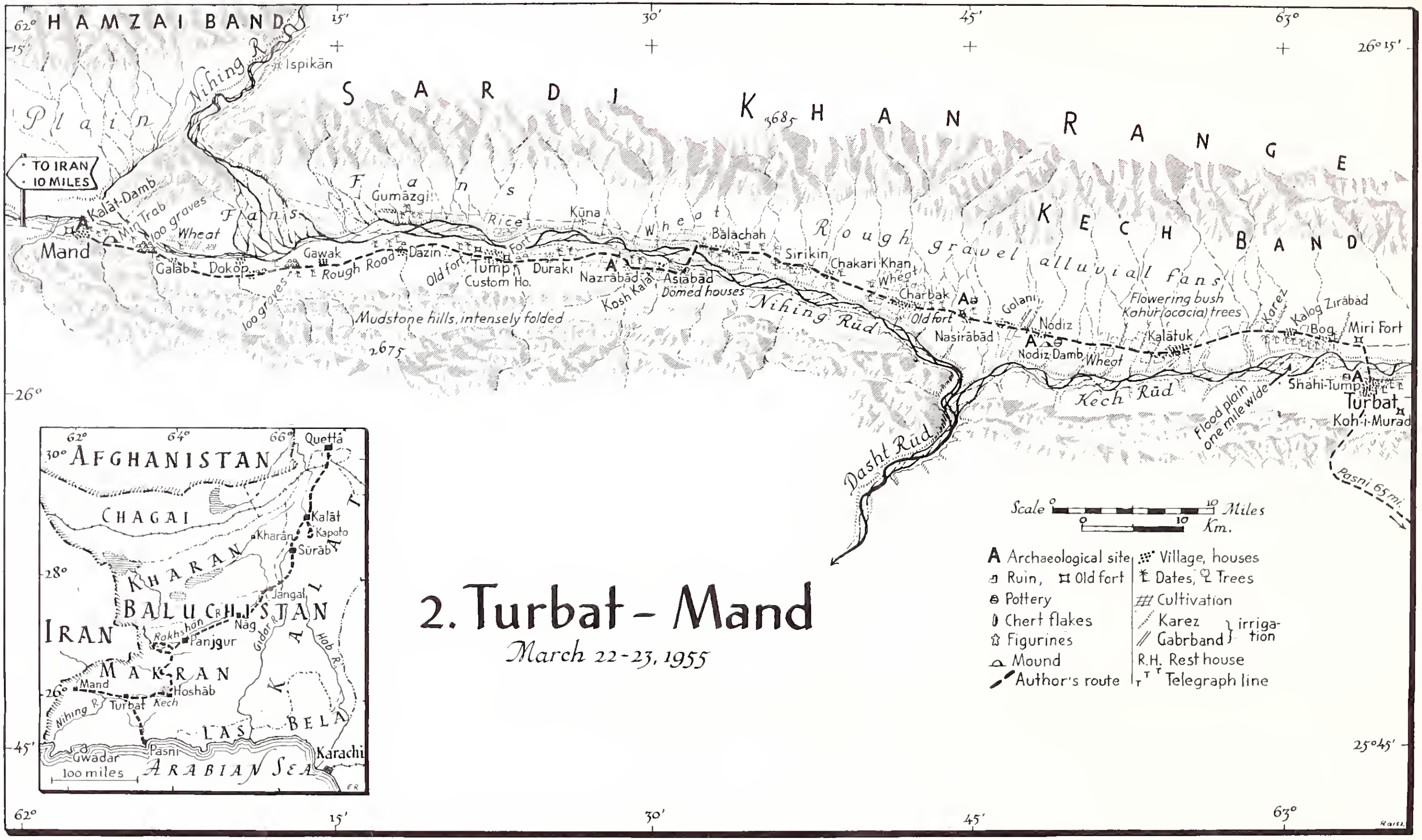

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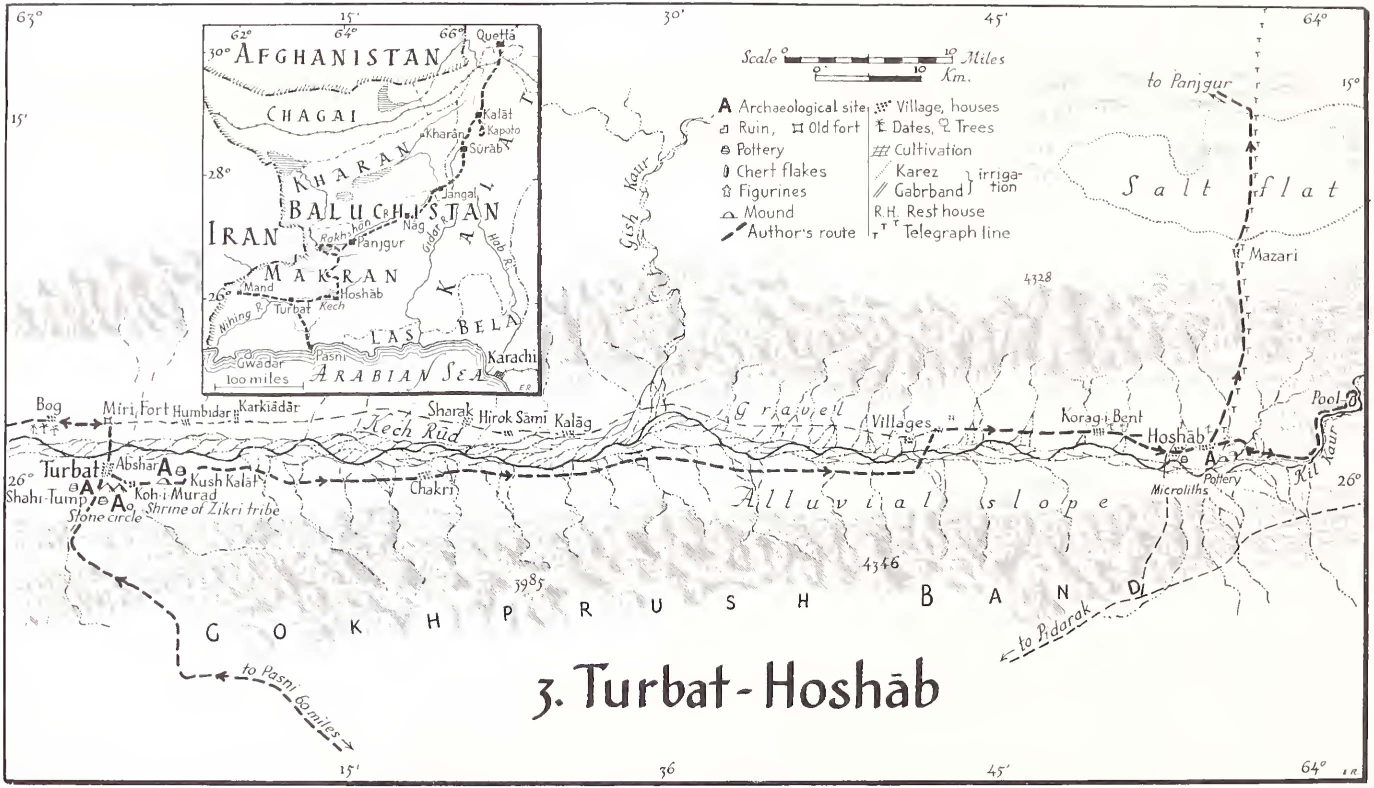

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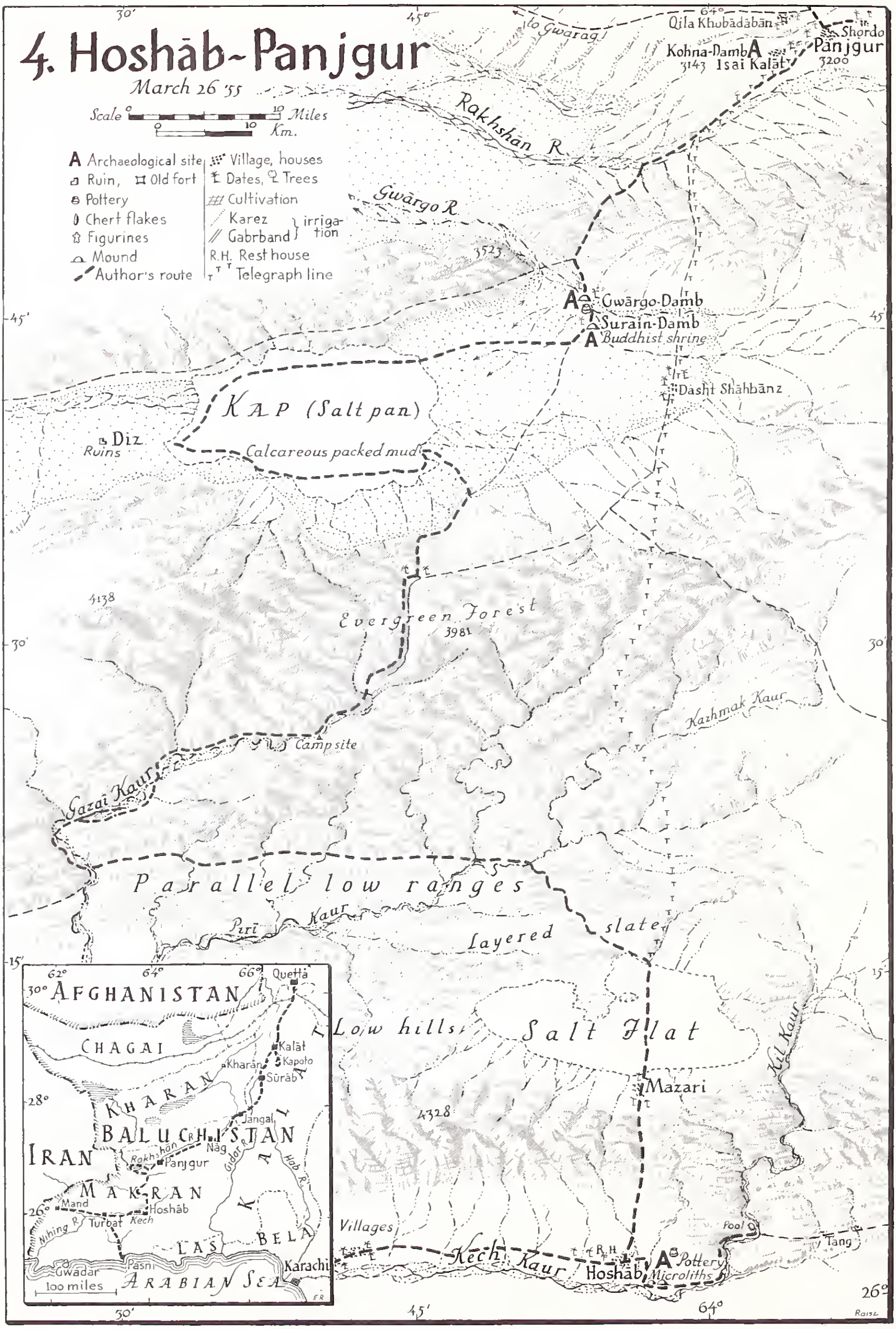

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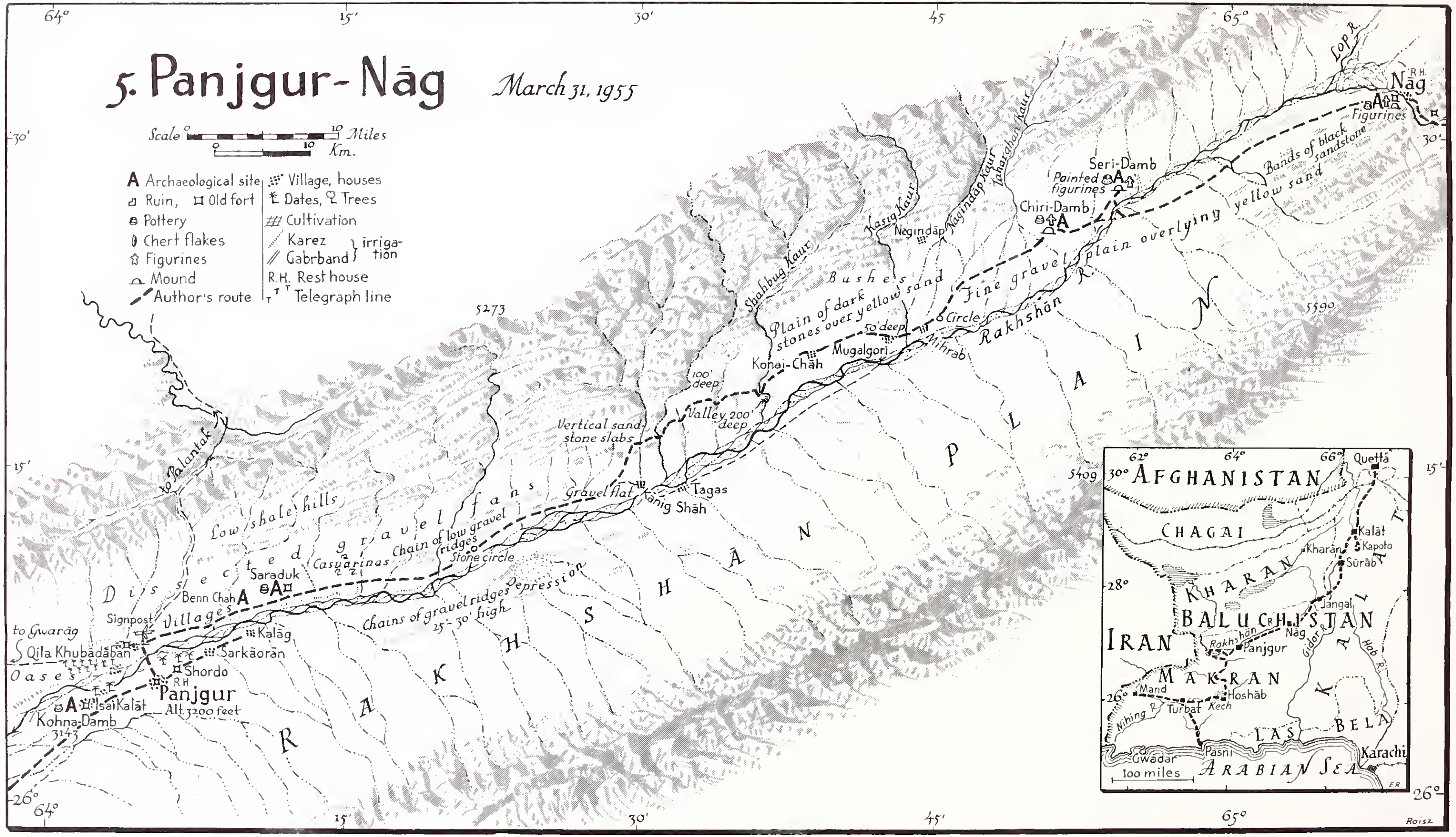
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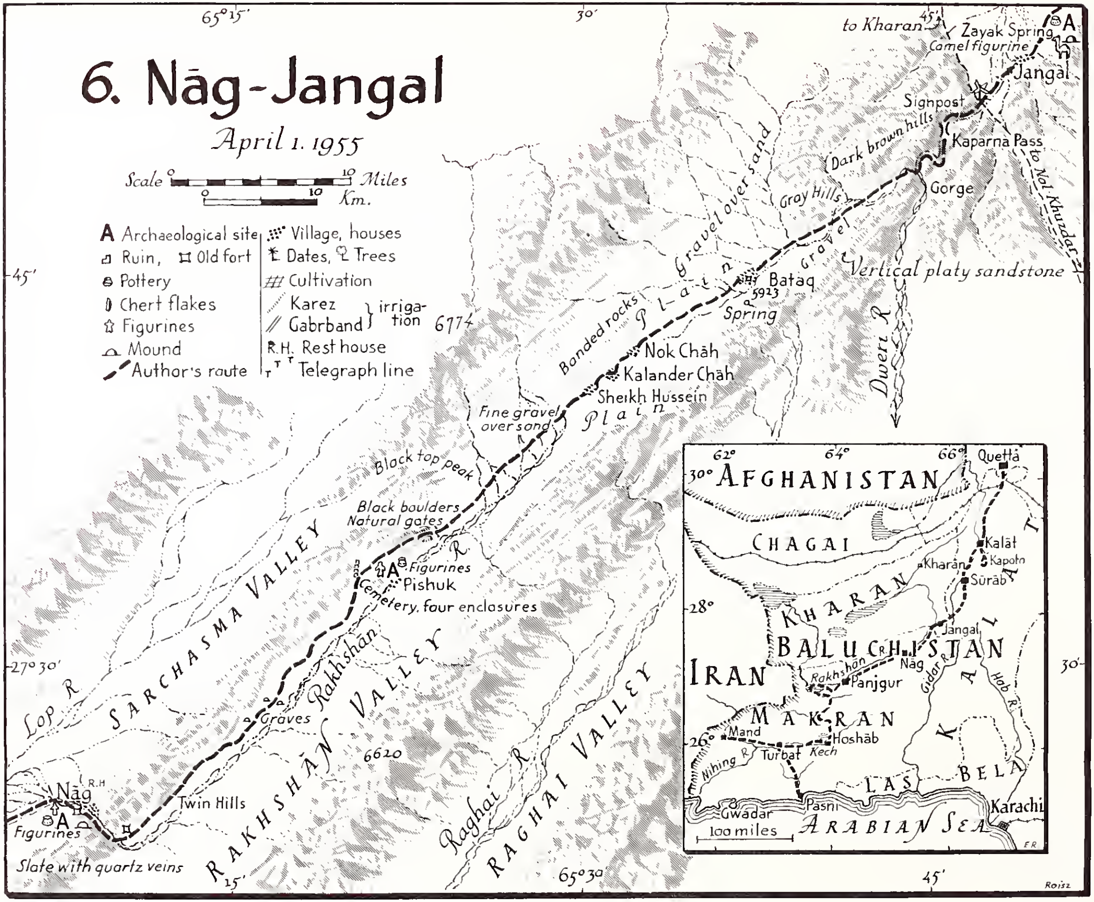

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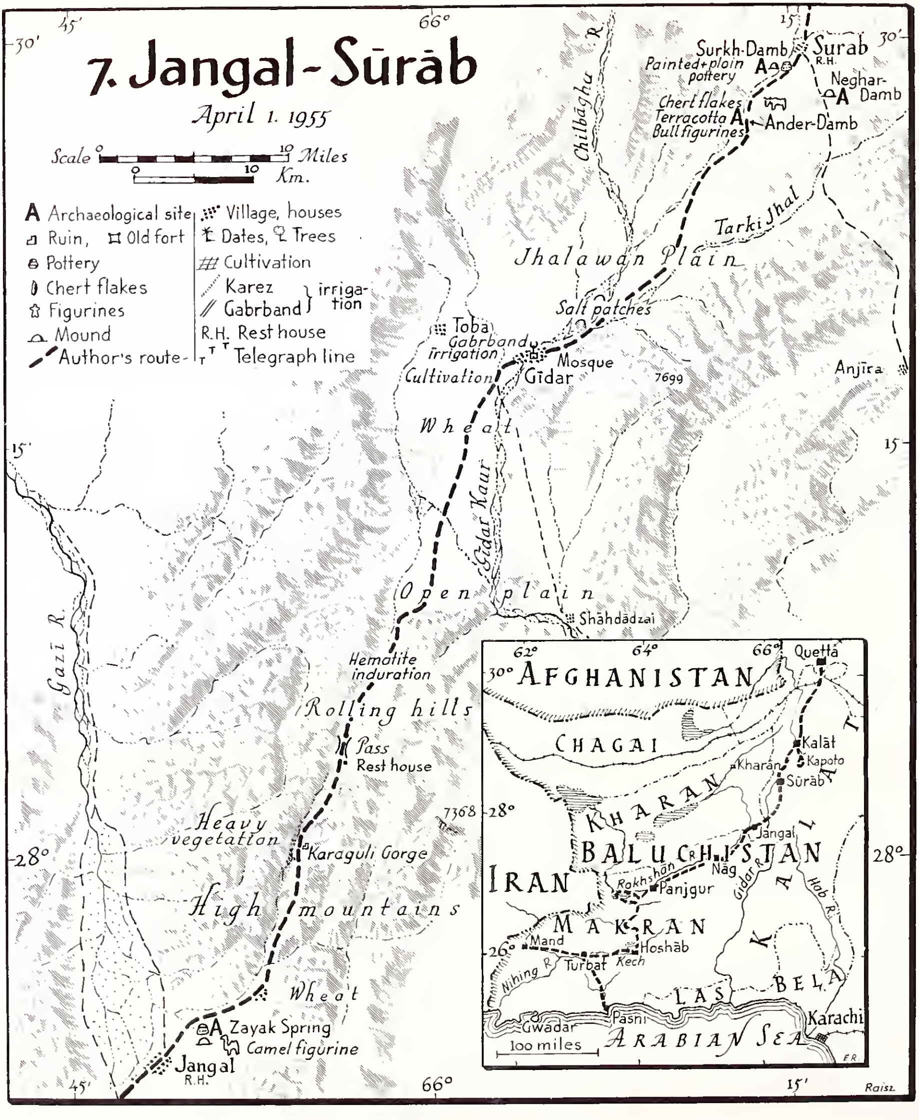

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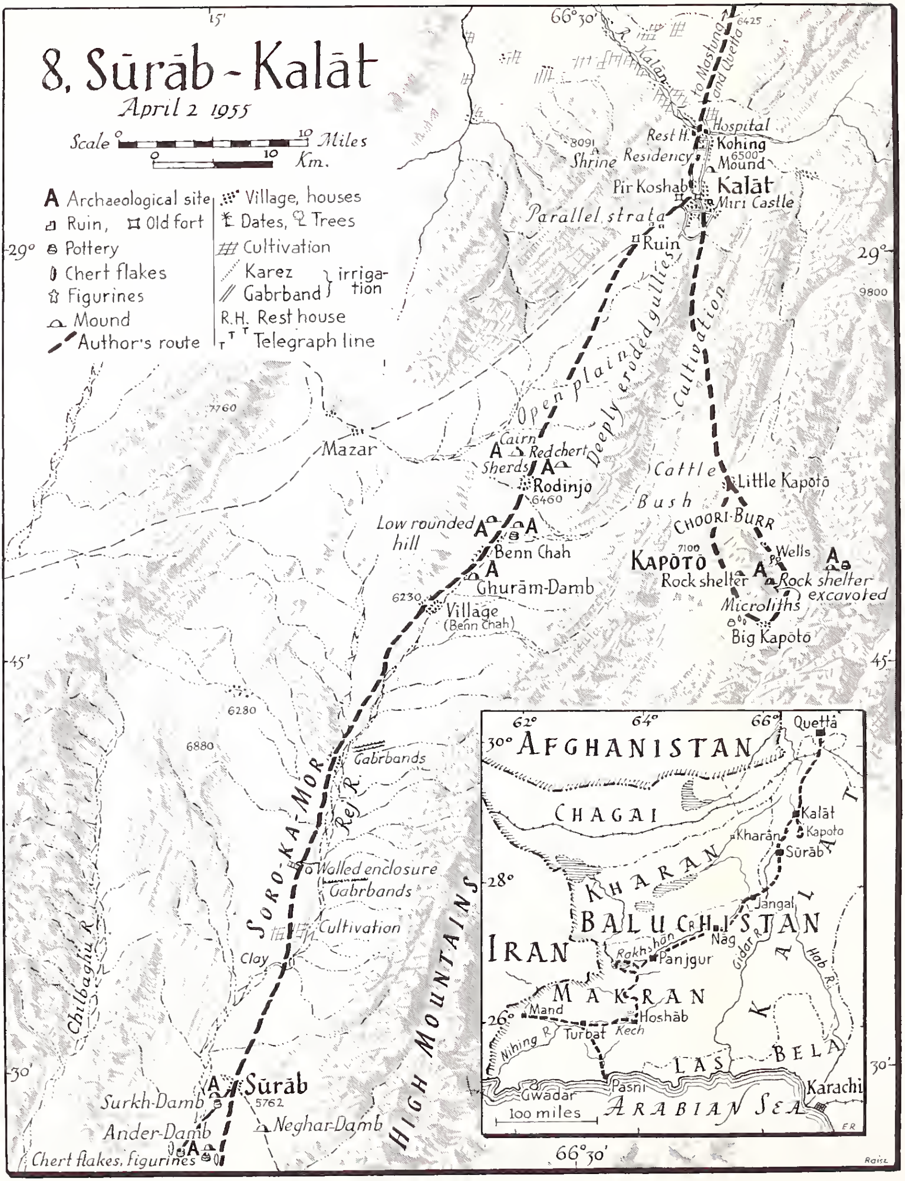
8, Sūrāb - Kalāt
April 2 1955
Scale 0 10 Miles
0 10 Km.
A Archaeological site
Ruin, Old fort
Pottery
Chert flakes
Figurines
Mound
Author's route
Village, houses
Dates, Trees
Cultivation
Karez } irrigation
Gabrband
R.H. Rest house
Telegraph line
15'
66°30'
29°
45'
30'
R. Kalān
6425
to Mastung and Quetta
Hospital
Rest H.
Kohing
8091
Shrine
Residency
6500
Mound
Pir Koshab
Kalāt
Miri Castle
Parallel strata
Ruin
Deeply eroded gullies
Cultivation
Open plain
9800
7760
Mazar
Cairn
Red chert
Sherds
Rodinjo
6460
Cattle
Bush
Little Kapōtō
Choori-Burr
Low rounded hill
Benn Chah
Kapōtō
7100
Wells
Rock shelter
Rock shelter excavated
Ghurām-Damb
6230
Village (Benn Chah)
Microliths
Big Kapōtō
6280
6880
Gabrbands
Rej R.
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Walled enclosure
Gabrbands
Cultivation
Clay
Chilbaghu R.
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Sūrāb
5762
Surkh-Damb
Ander-Damb
Neghar-Damb
Chert flakes, figurines
62°
64°
66°
Quetta
30°
Afghanistan
Chagai
Kalāt
Kapoto
Kharān
Sūrāb
Kharan
28°
Jangal
Baluchistan
Kalat
Iran
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Hab R.
Makran
Mand
26°
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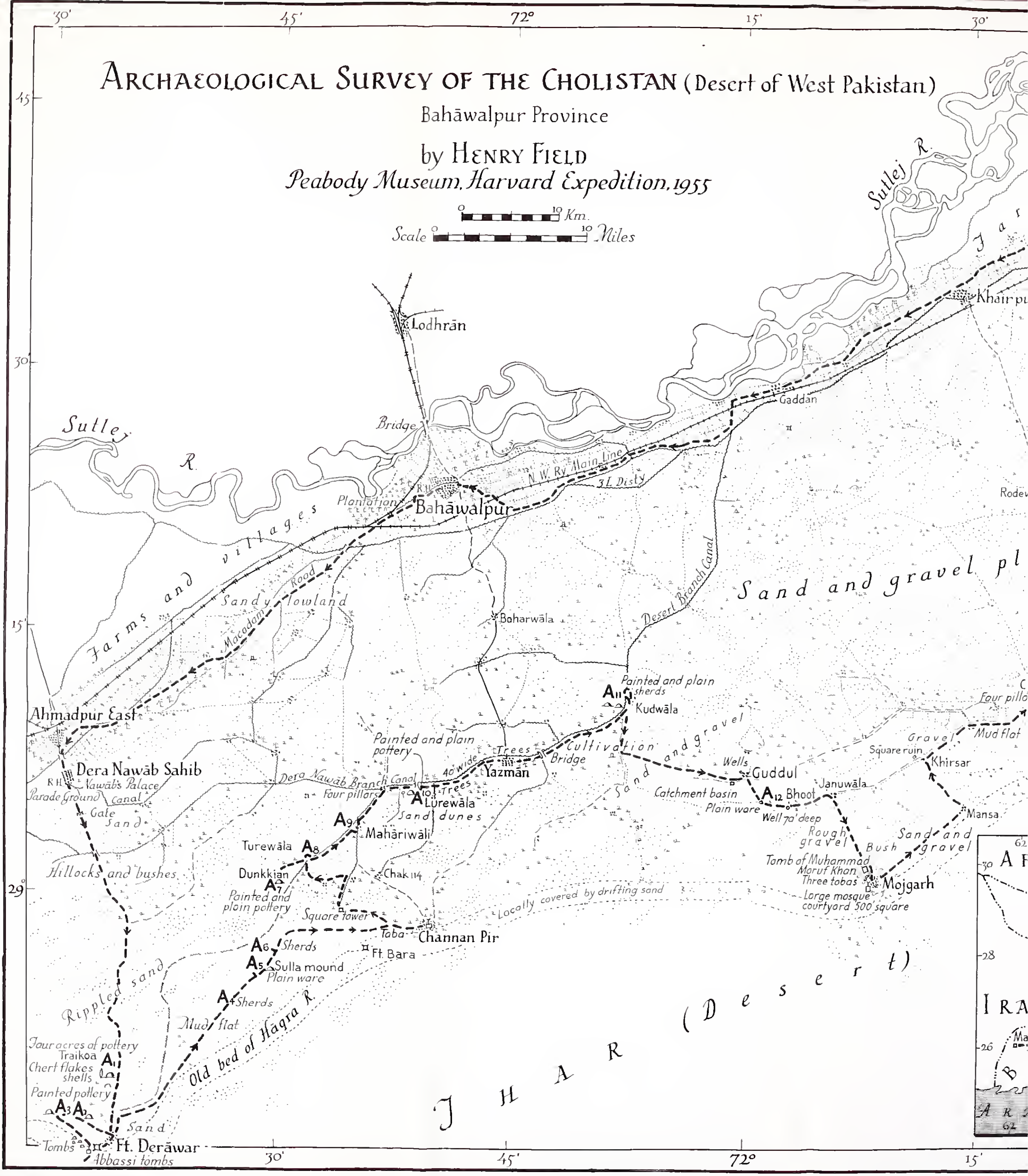
Arabian Sea
100 miles
ER
Raisz

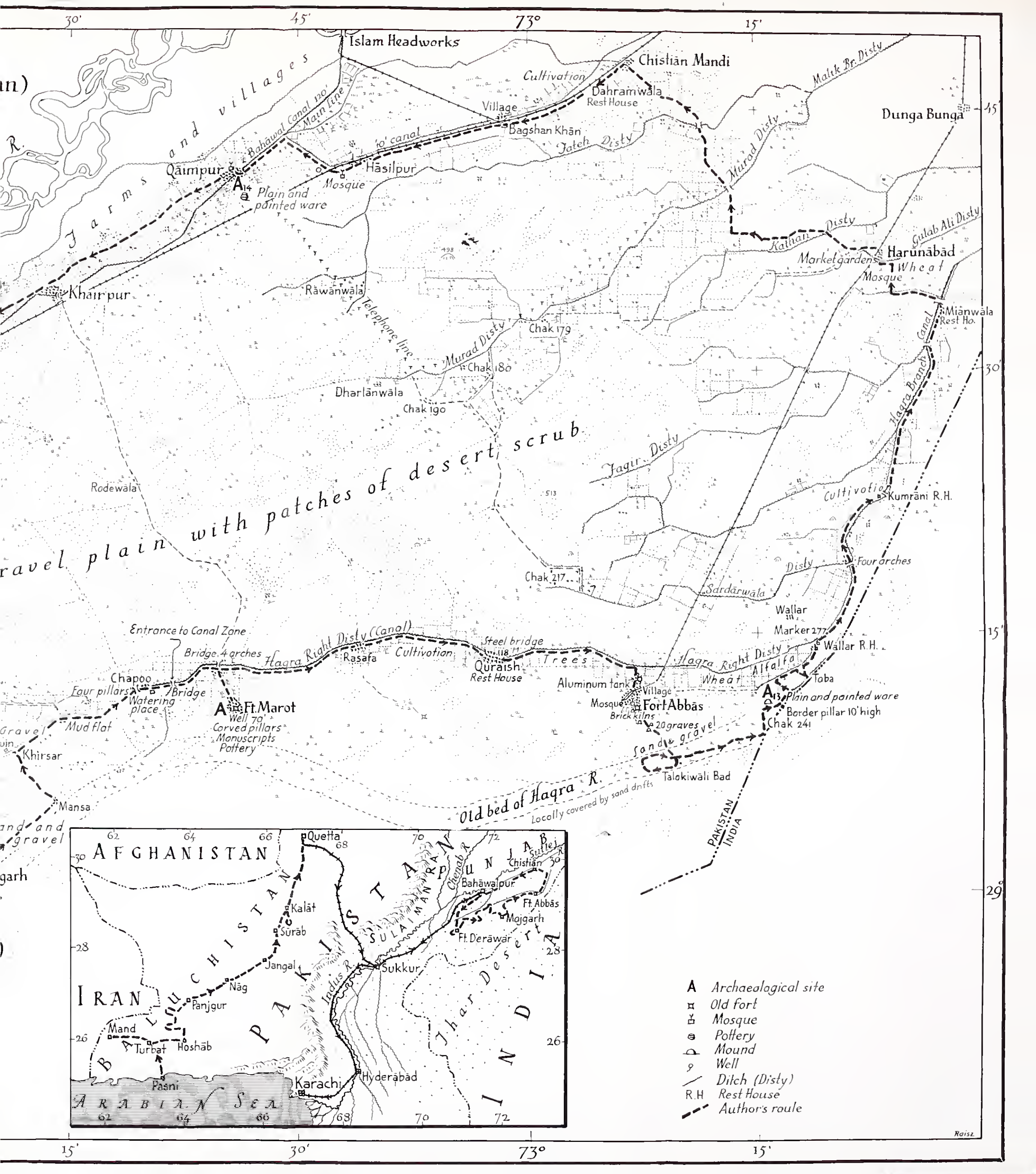


ARCHAEOLOGICAL SURVEY OF THE CHOLISTAN (Desert of West Pakistan)

Bahāwalpur Province

by HENRY FIELD

Peabody Museum, Harvard Expedition, 1955



30'
45'
73°
15'
Islam Headworks
Chistian Mandi
Dahramwala Rest House
Cultivation
Village
Bagshan Khan
Fateh Disty
Malik Br. Disty
Dunga Bunga
45'
Farms and villages
Bahawal Canal No. Main Line
'o' canal
Qaimpur
A14
Plain and painted ware
Hasilpur
Mosque
Murad Disty
Kathan Disty
Gulab Ali Disty
Harunabad
Market gardens
Wheat
Mosque
Khairpur
Rawanwala
Telephone line
Chak 179
Mianwala Rest Ho.
Canal
Murad Disty
Chak 180
Dharlanwala
Chak 190
30'
Hagra Branch
Gravel plain with patches of desert scrub
Jagir Disty
Rodewala
513
Cultivation
Kumrani R.H.
Four arches
Disty
Chak 217
Sardarwala
Wallar
Marker 277
15'
Entrance to Canal Zone
Hagra Right Disty (Canal)
Steel bridge
Wallar R.H.
Bridge 4 arches
Rasafa
Cultivation
118
Trees
Hagra Right Disty
Alfalfa
Chapoo
Quraish Rest House
Aluminum tank
Wheat
Toba
Four pillars
Bridge
Watering place
A Ft. Marot
Well 70'
Carved pillars
Manuscripts
Pottery
Village
Mosque
Fort Abbas
Brick kilns
20 graves
A13
Plain and painted ware
Border pillar 10' high
Chak 241
Mud flat
Gravel
Khirsar
Sand & gravel
Talokiwali Bad
Mansa
Old bed of Hagra R.
Locally covered by sand drifts
Sand and gravel
PAKISTAN
INDIA
29°
AFGHANISTAN
Quetta
62
64
66
68
70
72
30
28
26
PUNJAB
Sutlej R.
Chistian
Chenab R.
Bahawalpur
Ft. Abbas
Mojgarh
Ft. Derawar
SULAIMAN RAN
PAKISTAN
BALUCHISTAN
Kalat
Surab
Jangal
Nag
Panjgur
Sukkur
Indus R.
Thar Desert
INDIA
IRAN
Mand
Turbat
Hoshab
Pasni
Karachi
Hyderabad
ARABIAN SEA
A Archaeological site
Old fort
Mosque
Pottery
Mound
Well
Ditch (Disty)
R.H Rest House
Author's route
Raisz
15'
30'
73°
15'